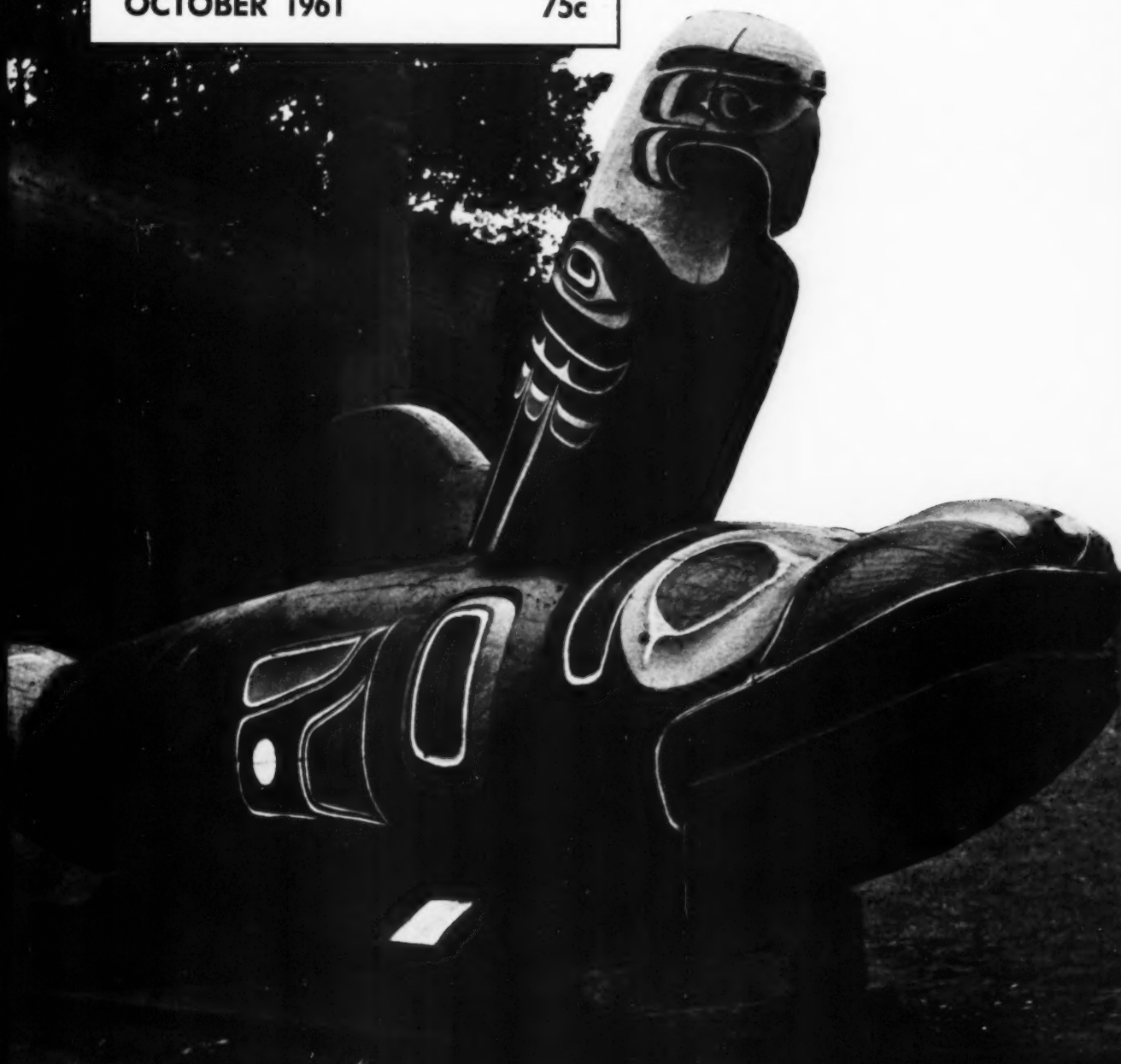


SCIENCE OF MAN

OCTOBER 1961

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PHOTOGRAPHY • MICRONESIA • TRANSPACIFIC MIGRATIONS

Editorial



Anthropology in the Secondary Schools

These are days when educators are concerned with curriculum evaluation. In 1957 Russia launched Sputnik, and we as a nation began to wonder if our schools were meeting the challenge of the twentieth century atomic and space age. Senators, military leaders, and citizens wanted to know why our educational institutions did not give top priority to the physical sciences. The initial response of educators to all of this furor was to propose crash programs in physics, chemistry and mathematics. In time, America learned to live with being second in space. We felt, however, that it was time to sit down and take a long and penetrating look at what we as Americans want to accomplish through our educational system.

There are important questions which must be answered: "Do we only want to keep up with the Russians? Are we doing things for the American child which the Soviets do not consider necessary? Should education in a totalitarian state and in a democratic state be identical?"

I believe that the answer to all of these questions is that while we must have quality education which stresses sound academic subjects, the American student needs more than what is offered Soviet youth. The most important thing which we can stress is the value of free expression of ideas and the encouragement of critical and creative thinking. If understanding the nature of the physical universe were the most important aspect of living the Soviet system would provide an ideal model for us to copy. But, it would seem that it is equally important to understand the nature of man.

The principal question in a free, democratic society should be, "Do we adequately help our children to understand the dignity of man and the nature of human nature, or do students emerge from our high schools with confused ideas about racial differences, the quality of primitive and foreign peoples and the nature of mankind as a species?"

For a number of years high school curriculums have included courses in world and American history, citizenship and geography. These courses are valuable, but something more is needed in the twentieth century when the majority of nations making up the United Nations have cultures which could be classified as other than western.

History provides valuable understanding of the past and how it has influenced our way of life. But history, as taught today, deals primarily with western European civilization. It gives our stu-

dents little which would help understand the Africans, the American Indians, the Indonesians or oriental peoples.

Geography acquaints the student with foreign countries, but where these courses are offered they are far too often concerned with topography, climate and commercial products rather than with the culture of the people. Citizenship courses are as valuable as any which are taught, but we must understand that citizenship today involves being a citizen of the world. This carries the responsibility of understanding the nature of man and his works in all parts of our globe.

It is unfortunate that the only discipline which deals with man cross-culturally has been virtually ignored by our secondary school teachers and administrators. Anthropology is taught today in less than a dozen high schools in the United States. As a result, there are no secondary school textbooks in anthropology and, until this past summer, no programs for training public school teachers in anthropology.

While educators have long stressed the value of interdisciplinary courses, the only discipline which is, by its very nature, integrated and wholistic, has not found its way into the curriculum. Anthropology is the study of the whole man. Therefore, it deals with man's biological makeup, his historical development, his numerous forms of government, family, religion, literature, music and his methods of surviving in a variety of geographical environments. Anthropology provides a most fundamental background for college work and at the same time provides students with a wealth of information and attitudes which every knowledgeable citizen should have.

Recently the American Anthropological Association formed a committee to explore the possibilities of teaching anthropology in the high schools. The chairman of this committee, Malcolm Collier, 5632 Kimbark Avenue, Chicago 37, Illinois, would welcome any information concerning the extent to which either anthropological concepts or actual courses in anthropology are presently being taught in our public schools. This committee would also be more than happy to advise teachers as to how anthropology can be brought into their teaching.

The first training program in anthropology for secondary school teachers was held at the University of California, Santa Barbara, June 18 to July 28, 1961. This summer institute, financed by the National Science Foundation, brought together a group of high school teachers for training in nearly all aspects of anthropology.

The course outline for this institute read as follows: Topic I—Man's Habitat, taught by Dr. Lamont Cole of Cornell University; Topic II—Human Evolution, by Dr. Joseph Birdsall, UCLA; Topic

III—The Development of Culture, by Dr. Fay Cooper-Cole, University of Chicago; Topic IV—The Nature of Culture, by Dr. Edward Spicer, University of Arizona; Topic V—Anthropology and Modern Life, by Dr. Fay Cooper-Cole.

Teachers who might be interested in future summer institutes may secure information by writing Summer Institute Program, National Science Foundation, 2101 Constitution Avenue N.W., Washington 25, D.C.

Anthropologists who are interested in seeing their subject taught at the high school level (see bibliographic list) believe that it will probably be a long time before this happens, but they feel that the findings of anthropology could be incorporated in a variety of traditional courses. Even at the primary school level they would like units on the American Indian, taught by people who have studied the American Indian, in a course taught by an anthropologist.

There is no lack of interest in the subject matter of anthropology. Nearly every Sunday supplement carries an article on some aspect of evolution or primitive man. The problem is that so much pseudoanthropology has crept into our culture that there is a real need to present the genuine article.

Can there be any doubt that the student preparing to live in a world made tiny by jet transportation should be exposed to a discipline which will provide: (1) an understanding of all cultures, (2) a respect for the rights and beliefs of others, (3) a scientific basis for the evaluation of races, (4) a knowledge of what constitutes personality and how it influences and is influenced by culture and (5) a further understanding of our way of life and its institutions? How long can we afford to deprive our young people of this educational influence when cultural understanding might indeed be the key to survival?

Lowell D. Holmes, Ph.D.
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Articles on Anthropology and Education by Anthropologists Published in Education Journals

- Alpenfels, E. J., "Members One of Another." *National Parent-Teacher* 46:11-13, Sept. 1951. (15c; 700 N. Rush St., Chicago.)
- Armogast, D., "Words and Ways of Men: Survival Education." *New York State Education* 38: 480-2, April 1951. (50c; 152 Washington Ave., Albany 10, N.Y.)
- Ehrich, R. W., "Anthropology in the Liberal Arts Curriculum." *Journal of Higher Education* 25: 357-61 Oct. 1954. (60c; The Ohio State Univ., Columbus, Ohio.)
- "The Place of Anthropology in a College Education." *Harvard Educational Review* XVII 57-61, Winter '47. (75c; Graduate School of Education, Harvard Univ.)
- Eggon, Fred, "An Anthropologist Looks at Discipline." *Grade Teacher* 76:55-, April 1959. (60c; Darien, Conn.)

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SCIENCE OF M A N

A MAGAZINE DEVOTED TO THE STORY OF MAN, HIS WORKS, AND HIS PAST AND TO THE POPULAR PRESENTATION OF THE FASCINATING STORY OF ARCHEOLOGY, ETHNOLOGY AND THE OTHER SCIENCES OF MAN.

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LAST DAYS OF PETROGLYPH CANYON



Text and Photos by Rex Eidson

IN RECENT PUBLICATIONS, there has been no mention of the Lewis and Clark expedition's recording of a large Indian village on the north bank of the Columbia, just east of the present city of The Dalles, Oregon.¹ The first archeological excavation done on the Wakemap² village, as it had been called, was in 1926. At that time, archeologists Strong, Schenk, and Stewart from the University of California made a number of valuable discoveries though they little more than scratched the surface of the mound. The end result of this scientific work was the publication of a book, "Archeology of the Dalles-Deschutes Region." Subsequent investigation of the mound showed it to have a diameter roughly of some 350 feet.

In 1956—overnight it seemed—news-papers up and down the river carried story after story about Wakemap Mound. Realization suddenly dawned in certain civic and scientific circles that as soon as the great multipurpose dam was completed, water would rise and form a vast lake, Lake Celilo, behind the massive concrete pylons. Thus would innumerable prehistoric treasures thereafter be out of reach, perhaps lost forever. Con-

sequently, aroused scientists under the direction of Dr. Douglas Osborn, University of Washington Museum curator, Seattle, and Dr. Luther S. Cressman,³ head of the Department of Anthropology at the University of Oregon, Eugene, Oregon, and outraged citizens of bordering communities made great efforts to accomplish a herculean task, timewise.

Many of the citizens quickly turned avid amateur archeologists. They were joined by organized groups of amateurs, notably the Oregon Archeological Society. In the early days of their work, all were hampered by lack of funds⁴, lack of equipment, lax political interest, and some quarreling in their own ranks. It was Dr. Osborn who worked for unification of all efforts and finally succeeded in establishing fine working relations.

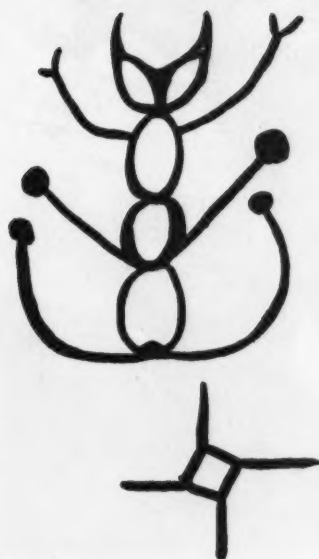
In many places at the Mound, workers following an elaborate archeological grid, cut to bedrock some twenty feet down. Charcoal in the first ten-foot stratum yielded an age in excess of 2000 years as indicated by the carbon 14 test.⁵ Yet experts estimated the petroglyphs to be only some 500 years old, even the very oldest not carved more than 1000 years

ago.⁶

More than 10,000 artifacts had been uncovered, including many interesting projectile points. One was identified by Dr. Alex Kreiger, archeologist and former director of Riverside City Museum (Calif.), as a 16,000-year-old spearhead (a Folsom point) used for elephant and mastodon hunting. Other items, indicators of the culture enjoyed by these people, were bone carvings, triangular, unbarbed points, stone carvings, mortars and pestles, miscellaneous trinkets, boat anchors, and so on.

Throughout the various midden layers, it was obvious that here was a true stone age culture. No pottery fragments (potsherds) had been uncovered except in the sketchy top layer which had been considerably disturbed and the people of which had doubtless felt white man's influence. In all, there were four distinct levels of culture, from the very crudest old stone age to what might be called the top of the new stone age.

In discussing the impending destruction of the site that last morning, one of the fellows in our small party⁷ made the sage remark, "All too often destruction



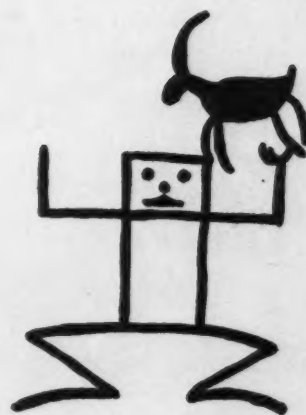
Sun Worship

Fig. 46.



Man and his Environment

Fig. 47.



The Successful Chase

Fig. 48.

of precious things of the past hides behind a slogan, 'Progress at any price.' For the materialist living purely in the "now," the past is meaningless. Unfortunately, culture has very little influence on him. He is aided and abetted by the careless and the thoughtless. Though man appears to have trod every inch of our globe at some period in the complicated history of *Homo sapiens*, it is not always easy to find the traces he usually left behind. The materialist, the careless, and the thoughtless make the task of finding these traces doubly difficult.

Carrying light packs, we paused by the railroad fill to talk briefly with an archeologist taking last-minute measurements and "rubblings."⁹ Our packs contained cameras, tripods, film, sketch pads, and notebooks. We also carried with us a gallon of latex, a quantity of heavy cloth, and a large paintbrush. With the latex, cloth, and brush, we hoped to secure patterns of some of the smaller, sharper glyphs which would be suitable for making plaster of Paris reproductions⁹. James Hansen, a Vancouver, Washington, sculptor, was busy at work with his new wax method for making replicas.¹⁰

One woman scientist was working on a face chiseled into a boulder. At the base of the north slope of the railroad fill, a large, passionless face peered at us. It was at the top end of an eight-foot stone "pillar." Though defaced, the nose almost broken away by time and modern handling, this face was readily recognizable as human, ancient, foreign.

Whose face was this? Why was it there? Did it represent a primitive deity, or was it a memorial to a great hunter

of the hinterland? Perhaps it was a monument erected in memory of a foreign visitor. It was difficult if not impossible to date; however, one thing was clear: this face was hundreds of years old.

Taking only passing glances at the last hurried strokes being made in the stratified trenches of Wakemap Mound, we turned directly toward the river over the twisted lava surface, to the edge of the water. It was a distance of perhaps 300 or 400 yards.

Here we viewed again the famed "Water Devil." (See Figs. 59 and 60.) According to legend, there once resided in the Columbia River, long before the advent of white man, a race of giant turtles. Possibly these were a supplement

to the salmon, the chief item of diet for the river people. When the salmon runs were poor, the huge turtles doubtless were hunted in great numbers. If there were several consecutive years when salmon runs were poor, the turtle population must have suffered very greatly indeed. So much, perhaps, that this was the beginning of the end. As far back as memory goes they have been extinct.

The Water Devil carving at the top of a six-foot basalt palisade, likely was intended to be a supplication to the river gods to make the turtles more prolific. It is possible that the great turtle itself was deified. Or it may have been a "mana" stone¹². Aside from the intriguing manner of presentation and the symbols sur-

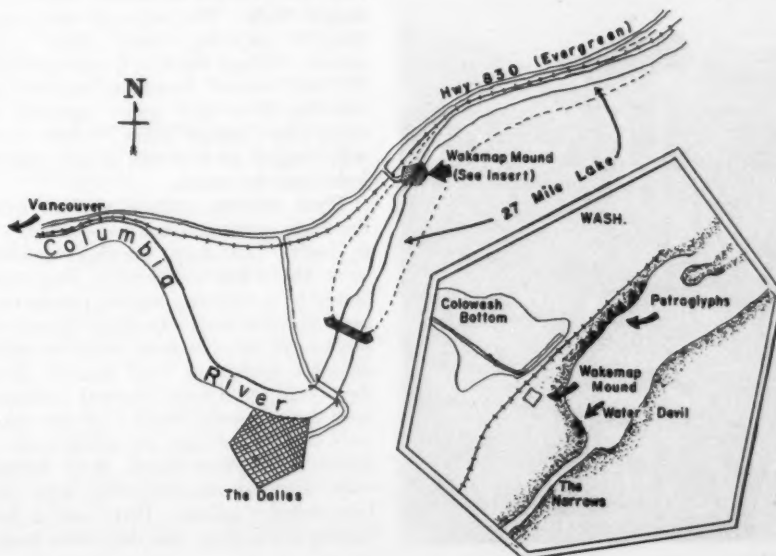




Fig. 58. In the easternmost shelter hole. Left to right: Johnnie and Bill Dailey looking toward Upper Memaloose Island. The wooden "snow shovels" at Bill Dailey's feet were items left behind by scientists who had already worked over the ground. The small white blob in the left foreground is freshly poured plaster over a clay impression of a small sheep carving. Note weird carving high above the bag at left center. It appears to be a death symbol relating to an old Indian custom. This was the old Indian practice of standing the dead, after rigor mortis had stiffened the deceased, on his head in some lonely spot. There were innumerable carvings on the cliffs in the background. These are now under water.

Fig. 59. Detail of the Water Devil. Note depth and smoothness of incisions. This giant turtle, if it is indeed a turtle, appears ludicrous on close inspection. Whoever heard of a turtle with rabbit ears? At the right is a "totem," perhaps the family tree of the unknown sculptor.



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rounding the large central figure, a most peculiar feature of the petroglyph was the depth of the engraved lines. They were no mere peckings or scratchings in the glass-hard rock. They were definitely carved, in some places to a depth of three-quarters of an inch. The main outlines were rounded channels an inch wide.

Many months, even years, must have gone into carving this petroglyph. At first, rough, crude channels must have been cut with stone chisel and mallet. Then round-tipped stones, perhaps with some sort of handles affixed to gain leverage, must have been grouted along these lines. This must have been done not just a few times, but literally thousands, and with pressure, in order to obtain the smooth, rounded effect. This may have been the lifetime work of a particularly powerful medicine man.

From the Water Devil, we turned our attention to Lower Petroglyph Canyon proper, about a half-mile east across the river-end of Colowesh Bottom. We finally reached it by climbing steeply through a boulder field. We were consumed with thought as we trudged down and then up again, following well marked trails. The trails were flanked by debris cast aside by curious sightseers and haphazard photographers — lunch sacks, beverage cans and bottles, empty food tins, waxed paper, burnt flash bulbs, black flags from film packs, *et cetera*.

"Well," one of the boys soberly expressed himself, "it won't be long now until the old river cleans up all this mess!" How right he was, for in just one short week the floodgates of The Dalles Dam would be closed and within a matter of hours, Lower Petroglyph Canyon would be no more.

This particular part of the canyon consisted of a wide strip of bedrock some thirty or forty feet above the current river level, flanked serpentine fashion by ragged cliffs. The principal area was, roughly speaking, some thirty rods square. Though much of it was relatively flat with several foot-deep mortars cut into the floor and many patterns of mystifying "marble holes,"¹³ there were some ragged spots as well as twin shelter holes near the center.

These roofless, natural shelters from the high, chilling winds were about ten to twelve feet deep, roughly circular, some fifteen feet in diameter. They were joined by a relatively narrow passageway on a different level. In these shelters in prehistoric times, women doubtless gathered for protection from storms. Here they could build fires. Hunters probably used them as well. Symbols of the chase were thickly cut into the black walls—dozens of bighorn sheep, deer, turtles, owls, thunderbirds, and even what has been called a pelican. There were a few human heads, also. And there were many



Fig. 60. Part of the bedrock area adjacent to the shelter holes. Note left foreground and middle background: Two mortars. The white speckling of the rocks is due to a growth of lichens.

abstract designs, some of which probably represented a form of worship, supplication to powerful gods, possibly interwoven with superstition.

On the eastern perimeter of the Lower Canyon, looking upriver toward Upper Memaloose Island (used from time immemorial as a burial place) was a series of petroglyphs. High above the water, they were incised into a vertical insert. Between this surface and the actual drop-off was a narrow space, a natural walkway. Though for the most part, the carvings were typical of an isolated stone age culture, here and there were discordant symbols. It was as though some foreign element had intruded in a remote period. For example, there was one somewhat in the form of an ancient Mayan helmet crest (Fig. 61).

Mrs. Maude Kapreilian of Kingston, New York, has done a great deal of



Extinct Long-Antlered Deer

Fig. 50.

OCTOBER 1961



Fig. 61. Detail of a section from the insert in the cliff high above the river. At the left is a remarkable symbol resembling the ancient Egyptian "key of life" (NH). Top center is some sort of beast wearing something looking like a Mayan helmet crest. At the right is an odd mixture of "devil," animal, and man. Perhaps it is a memorial to a successful hunt.



Fig. 62. A simple thunderbird on what appears to be a tombstone. There are two peculiar features about this particular, little bird: (1) his head, with eye, is a perfect bull's-eye, and (2) he is sporting an elephant's trunk rather than the conventional beak.

research relative to Indian symbols on a worldwide scale. Upon seeing a photograph of one of the abstract petroglyphs on the Columbia River, she said that it was very similar to ancient carvings in Armenia. In Armenia, in antiquity, they represented the spider and were considered quite sacred. So far as is known at the present time, the resemblance is coincidental.

On many high points of rock, in some places as much as thirty feet out of reach, were double circles, that is, one circle within another, after the manner of a bull's-eye. No one knows how the ancient sculptors worked in these high places. One possible reason for their existence, strangely uniform wherever they were seen, is that they were landmarks, lines of demarcation, or boundary markers.

Months before, archeologists had numbered and circled with lines of white paint certain outstanding glyphs to be removed. This work was actually the result of extensive campaigning by Walter Schuck of the Oregon Archeological Society.¹⁴ Some \$8,500 was made available

from an original National Park Service allocation for this last removal project. The actual removal was performed by a Portland contractor, the J. Bacaloff Construction Co., under the combined supervision of the Army Corps of Engineers and the Park Service. Already a barge was tied up in the river immediately below the cliffs, and a mobile crane and a bulldozer were hard at work picking up slabs removed by a jackhammer.¹⁵

The dense composition of lava rock¹⁶ is such that it is difficult to find where it will break away evenly. A few of the petroglyphs were destroyed or severely damaged because of incorrect cleavage. But during the following week, some twenty glyph blocks weighing from 200 pounds to ten tons each were freed from the great cliffs, hoisted by the crane and lowered to the waiting barge.¹⁷

We made one trip after this, the following Sunday. As we gazed upon the landscape we had come to know so well, we were seeing it for the last time. This was the day the water level would begin to rise. In fact, the gates to the great dam had already been closed and we had only two or three hours to linger. The crane was making the last spasmodic lunges to get the few remaining stone blocks with their precious prehistoric pictures aboard the barge. There was not a moment to lose. But the weather had held well; in fact, it was quite warm and the air was almost without motion.

There was something sad about the scene, the old making way for the new.

Throughout recorded history it had always been this way. In Europe, in the Middle East, in Asia—wherever man is intent on making progress or where some new ruler comes along with ambitious plans. Then the time-honored Old inexorably falls away before the virile New; the Old is destroyed or buried or pushed to one side, but not quite completely.¹⁸

Yet there was something satisfying also, in the knowledge that we had captured a little of the scene before it had completely changed. And we envisioned, in the long years to come, new generations enjoying and thrilling at the brief touches we had retained for them of this vanished culture.

REFERENCES

1. The name of The Dalles comes from the French, *les dalles* meaning flagstones. It was so named by French Canadians because of the wide expanses of flat bedrock, washed over during seasons of high water.
2. *Wakemap* is a modernized version of the original approximation of an old Chinook word spelled phonetically "wug'emap." In the now dead tongue, it meant an old witch or an ugly old woman adept at magic. In his book, *Stone Age on the Columbia River*, Emory Strong tells the interesting legend concerning this particular wug'emap. Book published by Binford & Mort, Portland, Oregon, 1959. See also article by Hub Strain, "History Hunters Race Columbia Dam," in the Northwest Rotogravure Magazine of the Portland Sunday Oregonian, October 28, 1956. Some of the petroglyphs of Wakemap were described by Mr. Eidson in his first article, "Signs of Life," *SoM*, Aug. 1961, p. 152.
3. Much of Dr. Cressman's early work (1952-3) was on the Oregon side of the Long Narrows



Fig. 63. A representative collection depot for petroglyph slabs removed from surrounding cliffs. Note the large X's in white paint which had been placed sometime before by archeologists as indications that these carvings were to be removed.



Fig. 64. Bill K. Dailey using paintbrush and latex in an attempt to get an impression of one of the petroglyphs removed from a nearby cliff. Because of improper backing, this method was not successful.

Fig. 65. Plaster reproduction of one of the small glyphs. Stain was used to bring out the pattern in the age-old carving. This was not one of the symbols saved from the floodwaters. However, a faithful plaster casting was made of the symbol so that it did not die out with the changing times. Just what it was originally supposed to represent is not known; however, a New York expert on ancient symbols says that it much resembles the sacred spider symbol of ancient Armenia.

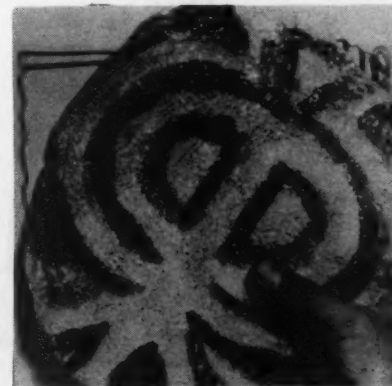




Fig. 66. Author squatting immediately above the Water Devil.

where excavation gave cultural traces positively dated at nearly 10,000 years.

4. The cost of the "last-ditch stand" eventually was shouldered largely by the National Park Service which set aside \$11,000 for the project.

5. Article by Rob Fields, "He's All in Favor of Digging," from the *Oregon Journal, Northwest Living Magazine*, January 22, 1956.

6. From official information given to the press by Col. Francis McBride of the U.S. Army Engineers, Portland, early in 1957. A low age estimate for Indian art in general (in America) is also emphatically given by Frederick H. Douglas and Rene D'Harnencourt in their book, *Indian Art of the United States*, Museum of Modern Art, 1941.

7. Bill K. Dailey who, in company with geologist Jack Grant, made a long trip into the Mayan jungles in search of proof of the antiquity of the aboriginal American. Mr. Dailey is a professional cartographer, and as an amateur speleologist, has mapped many of Oregon and Washington lava

tubes, as well as some of the newly discovered portions of the Oregon (limestone) Caves.

8. The classical archeological method of obtaining a quick mask or rubbing of an incised pattern is basically simple. Muslin cloth is stretched tightly over the figure to be rubbed, then rubbed with an ink roller. The roller is usually worked in two directions with different colors. One color is superimposed upon the other at right angles. The resulting design approximates the original.

9. This method we found was not very satisfactory, primarily because we did not know how to go about placing a proper backing on the impression. Later, we found that we should have used burlap strips, many of them, laid at right angles. However, we did secure several fine impressions with ordinary pottery clay, making plaster casts right on the spot.

10. Hansen had been interested in the project by James L. Haseltine and Dr. Carl Heller who belonged to an amateur group working to save what it could. He had perfected a wax method for making nearly perfect impressions from which equally perfect replicas could be produced. The only problem with Mr. Hansen's method was the large amount of equipment and materials needed on the job, and the resulting over-all expense. Some \$2500 was required to create about 25 impressions. Much of this amount was raised by popular subscription through the efforts of the Oregon Museum of Science and Industry, Portland. The impressions thus made have become a permanent collection of the Oregon Museum of Science and Industry.

11. See feature article by Louise Aaron, "Ever Seen a Petroglyph?" in the *Oregon Sunday Journal* (Portland), Dec. 2, 1956.

12. *Man: His First Million Years*, by Dr. Ashley Montagu. World Publishing Co., New York, 1957. Available through SoM Book Service, P.O. Box 808, Mentone, California.

13. Also mentioned in *Stone Age Along the Columbia River*, by Emory Strong.

14. Article by Louise Aaron, "Reproductions Sought on Vanishing Carvings," in the *(Portland) Oregon Journal* for November 29, 1956.

15. Front page news story by Walter Mattila, "Heavy Equipment Removes Carvings from Columbia Walls," in the *Oregon Sunday Journal* for February 10, 1957.

16. *How to Know the Minerals and Rocks*, by Richard M. Pearl, Associate Professor of Geology, Colorado College. McGraw-Hill Book Co. 1955.



Fig. 67. The author and Indian writings.

17. The glyphs were towed to The Dalles and stored pending determination of their final resting places in museums.

18. *Mirror for Men*, by Dr. Clyde Kluckhohn. The McGraw-Hill Book Co., New York. 1959.

A POTPOURRI OF INDIAN PICTURE WRITINGS

By Joseph E. Vincent

FOR MANY PEOPLE, whether interested in Indians or not, picture writings hold a fascination. Many people who show no interest in either the American Indian or other "native" cultures will go miles to look at an Indian picture-writing. The photographs and sketches of pictographs and petroglyphs—two forms of Indian picture writings—received by *SCIENCE OF MAN* are indicative to a small degree of the interest they attract.

In the Pahranaagat Valley and the sur-

rounding Irish Mountains near Alamo, Nevada, is an assortment of picture writings. (Figures 70, 71, 72, and 73.) Just what they represent is hard to guess. For the benefit of those interested in studying this group of writings or looking for more in the area, the contributors of these photographs, Mr. and Mrs. G. L. Davis of Alamo, have suggested that they call at Larry's Service Station on Highway 93 in Alamo for directions. They say the Indian writings are easily accessible.

In Tlacolula Valley in the State of Oaxaca, Mexico, are several picture writings. One, the Caballito Blanco, was discussed in previous issues (April 1961, p. 98, Figs. 34 and 35; June, p. 135, Fig. 38; and August, p. 177). Others less known though equally important are shown in the sketches on this page.

Just what the figure in number 74 depicts is hard to imagine. Anthropology student Dick Owens who sent the sketch, thinks that it may be a Spanish soldier. Figure 75 of a hand is depicted on a rock wall about natural size. What the four circles in the arc above the fingers represent is not known. Both the hand and the "Spanish soldier" pictographs

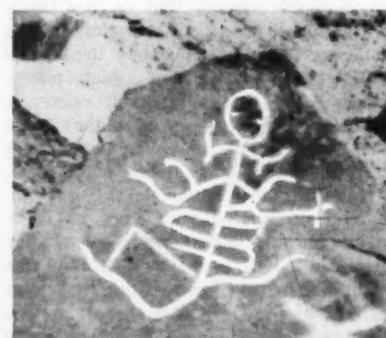
are together, very near the highway leading from the Caballito Blanco to Mitla and are painted in red.

The pictographs in the sketches of Fig. 76, 77, and 78 are found on the same cliff surface with the Caballito Blanco. Figure 76 may be seen above and to the right of the main figure on the cliff, 77 and 78 below it. All three are painted in red paint. The paintings shown in Figs. 76 and 78 are badly faded from time and erosion. Figures 76

Fig. 68. Detail from Fig. 63.



Fig. 69. Another detail from Fig. 63.



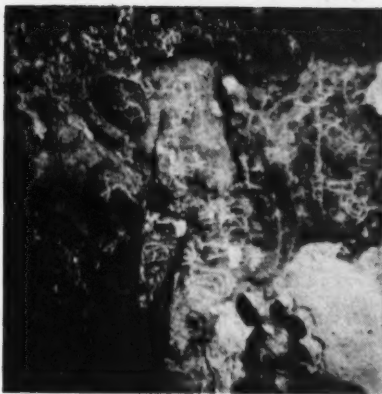


Fig. 71.

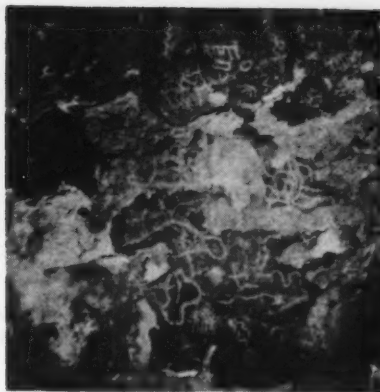
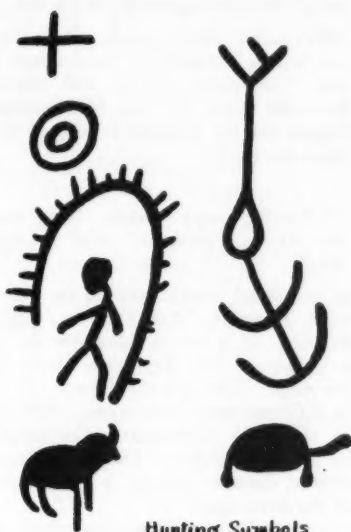


Fig. 72.



Fig. 70.



Hunting Symbols

Fig. 49.

and 77 undoubtedly depict animals, but what kind? Note the crosshatching in Fig. 77. This is something very seldom seen in picture writings.

Because of the hook at the top of Fig. 77, it has been suggested that it represents a primitive pinata. Could Fig. 78 represent a primitive map or a puzzle?

The glyphs represented in Figs. 76 to 78 are in a very inaccessible location high on a large cliff. Only proper lighting and a good telephoto lens can bring them out satisfactorily. Any interested amateur could do a good turn by making a special effort to visit this area and photograph these picture writings before they are completely removed by Father Time.

Near Vernal, Utah, are found the interesting picture writings shown in sketches 79 and 80. What does the squareheaded man in Fig. 79 represent? Surely not the same thing that "square-heads" mean today. And who is the Siamese twin in Fig. 80? Compare this with the two-headed figures of Mrs. Watson's in the April issue.

Surely the flying saucer men had not yet visited this earth when the figures in sketch 79 were made. Or had the artist merely imbibed too much that day?

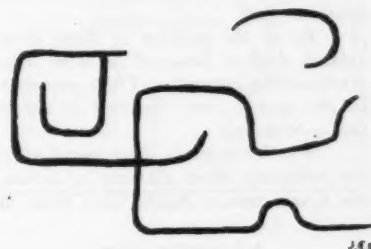
The small numbers in Figs. 79 and 80 are not a part of the picture writings but were added by the local archeologists as part of their accession numbers for further identification.

Figures 81 and 82 are representative of the many Indian writings to be found in the State of Sonora, Mexico. Those in Fig. 81 are from a site about 13 miles southwest of Caborca. When discovered in 1909, there were several hundred of

CONTINUED ON PAGE 212



Fig. 73.



J.E.V.



J.E.V.



Fig. 74.



Fig. 75 (Right).



J.E.V.

Fig. 76.

Fig. 77 (Left).

Natives of the Marshall Islands

Kwajalein Atoll

By Gerald A. Smith

San Bernardino County Museum

Judging from some of the letters received there is some confusion as to the exact meaning of the words "Polynesian," "Melanesian," and "Micronesian." While all of them contain the syllables "-nesian," coming from the Greek word for "island," we use them to refer to the people, and not to the islands directly. The Melanesian Islands, for example, refer to those islands inhabited by the Melanesian people and not to a group of islands because of their particular geographic location or geologic formation.

In general, the Polynesian islands (i.e., the islands inhabited by the Polynesian peoples) lie in the form of a large triangle, with Hawaii, Easter Island, and the North Island of New Zealand as its apexes. There are a few Polynesian islands outside of that triangle however. (Refer to map on the back cover of SoM, April 1961.) The Polynesian people are mainly of Caucasoid origin ("blood") although some of them may be quite dark because of the tropical sun.

Melanesia or the Melanesian islands are those islands between southern Polynesia and New Guinea. The Melanesian peoples inhabiting them are dark with frizzly hair and flat noses like those of New Guinea. We would therefore say that they seem to be largely of Negroid origin.

The Micronesian islands lie to the north of Melanesia, west of the Hawaiian Islands. The Micronesians show affinities to the Polynesians, the Melanesians, and to various other Malay and Indonesian peoples, thus indicating a possible mixture of all.

All of the peoples of these three ethnic groups speak related dialects believed to stem originally from a greater Austronesian language. There seems to be a gradual variation in the speech from the east to the west, due to migration and separation.

In order to make these island groups easier to remember, the following short glossary of Greek terms is given. Why the Greek names should have been chosen for these islands

is a little hard to understand when these three great groups of people have such a melodious language of their own.

austr-, south (Austronesia, southerly islands, or possibly "South Sea" Islands.)

melas, melanos, black (Melanesia, "Black" Islands, Islands of the Blacks. Note also our word "melanin," the coloring matter of the skin.)

mikros, small (Micronesia, little islands. Note also our words "micron," "microscope," and "micrometer." You will notice from the map that the Micronesian islands are the smallest in size of the three groups.)

nesos, island
polys, many (Polynesia, many islands. Note also our words, "polygon," and "polygamy.")

In the past we have published several articles on Polynesia (Samoa, Easter Island, Tuamotu, "Kon Tiki"). In this issue will be found the first of a series of three on a Micronesian group, the people of the Kwajalein Atoll of the Marshall Islands. (See map.) Although the Micronesians, as stated above are of a different racial admixture, they do not differ in many ways from the Polynesians with whom many of our readers are already familiar. They are about the same primitive, carefree, lovable people, a few years ago not too far away from the stone age.

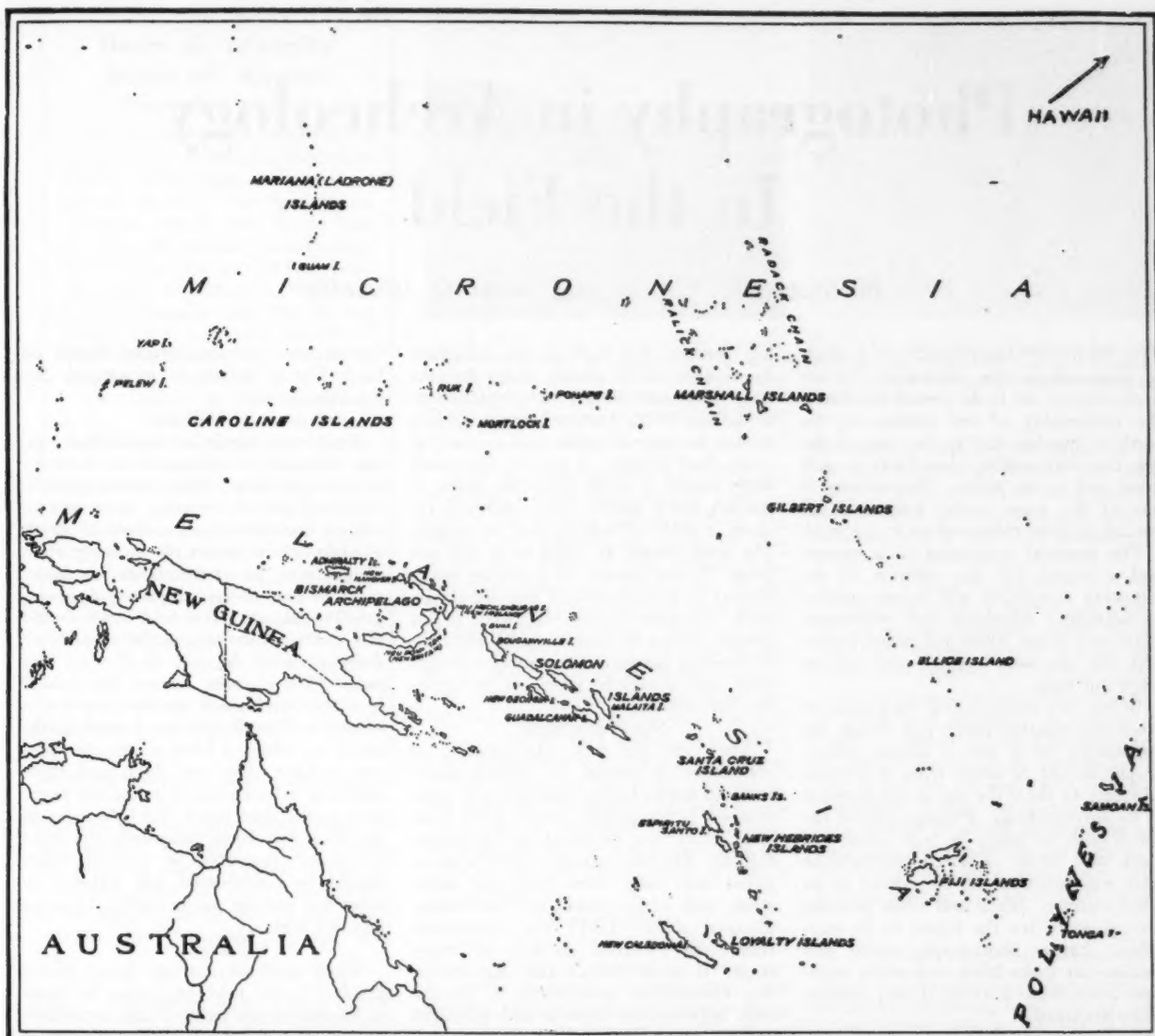
In this article, Dr. Gerald A. Smith, Superintendent of the Bloomington City Schools and Director of the San Bernardino County Museum, lays a firm foundation in geography, history, and ecology of the area, before telling of the customs and home life of the natives, which will follow in subsequent issues.

A Polynesian village.
(Courtesy of Department of the Navy)



A Marshall Island outrigger.





Geographical Background

Geographically, the Marshall Islands are located between $4^{\circ} 30'$ and $14^{\circ} 45'$ north latitude, and between $160^{\circ} 50'$ and $172^{\circ} 10'$ east longitude. They lie west of the international date line, and east of the Carolines, midway between Hawaii and New Guinea. They may be considered an eastward extension of the Caroline Islands which extend due westward almost to the Philippines. Roughly, the Marshall archipelago consists of about thirty-four low lying coral atolls and single islands arranged in two parallel rows running from north-northwest to south-southeast. The easternmost row, known as the Ratak Chain, is composed of two single islands and fourteen atolls. The westernmost, the Ralik Chain, is made up of fifteen atolls and three single islands. The two chains lie approximately 130 miles apart, and the average distance

between atolls of the same chain is nearly 50 miles. The total sea area occupied by the two chains is approximately 375,000 square miles, while the total land surface constitutes an area of only 74 square miles.

Because of their position in the low latitudes, and their small land area, the Marshall Islands have a tropical climate of marine type. Heavy rains characterize the climate, but the amount differs greatly with locality. The southern islands receive the greatest amount of rainfall and the distribution is fairly uniform over the year. The northern islands receive little rain during the winter months, as they lie squarely within the belt of the northeast trade winds.

Cloudy days are general throughout the entire area. The clouds are moved rapidly by a strong, cooling, northeast sea breeze. When the wind falls, as it sometimes does

during the summer months, it becomes very hot. In general, an almost easterly wind prevails, but during the summer there is some variability in the direction of the winds. Typhoons are the severest storms, but they are rare. Electrical storms are fairly common during the summer months.

The Marshall Islands are formed of coral built upward from submerged mountain peaks. These peaks once rose close to the surface of the sea and live coral gradually built upward from their summits to form atolls. The coral polyps received more food on the windward edge of the bed and built more rapidly, forming an irregularly circular reef of live coral surrounding a shallow lagoon. The Kwajalein Atoll is the second largest one in the world.

From atolls, islands are built later.

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Photography in Archeology

In the Field

By Stuart W. Conner and Denes G. Istvanffy

THE STUDY OF ARCHEOLOGY is a study of relationships—the relationship of the archeological site to the rest of the world, the relationship of one stratum in the earth to another and to the rest of the site, the relationships of artifacts to each other and to the strata. Photography is one of the more useful techniques of recording these relationships in the field.

The essential equipment is a camera and a tripod, but the addition of the following equipment will permit quality photography: telephoto and wide-angle lenses, lens shade, filters and portra lenses, with the necessary attachments and an electronic flash.

Before any archeological excavation or other investigation which will change the appearance of a site is begun, photographs should be taken from a distance adequate to show the site in relationship to its surroundings. Photographs of the site should be taken in both color and black and white. Colored photographs offer accuracy that can be secured in no other manner. Black and white pictures are necessary for the report to be published. Larger photography stores and studios can make black and white negatives from colored slides, if only colored slides are taken.

Scale

Every proper archeological photograph must contain within itself an accurate way of determining the true size of pertinent features. Sometimes this is accomplished by resting a tool beside the

key feature, but there is no substitute for a scale which clearly states its own size. The scale should be proportionate to the size of the feature being recorded, so that the scale is legible and meaningful in the final picture. A two- or three-inch scale beside a small projectile point is proper, but a buffalo-jump cliff will require a scale of several feet in length. The scale should be rigid so it will not bend. In the absence of a precise scale, objects of a standardized size should be used. Trowels are time-honored, if not precise, scales in archeological pictures. A standing person can serve as a rough scale, but should be posed so as not to face the camera.

Site Photographs

After the site has been cleared of vegetation, it should be photographed from all angles before excavation is commenced. [Photography before small trees and brush are removed is sometimes helpful. The photographs may be compared with later ones from the same spots, with aerial photos and with long-distance shots. Ed.] The excavation should be recorded on film at every stage. It is of considerable importance that obstructions and debris be cleared both between the camera and principal object, and from the background. Branches and tall grass may nearly mask the subject although be hardly noticeable to the eye. The camera cannot unconsciously adjust for such obstructions, as do the human mind and eye, but records them faithfully. Scattered equipment not only creates a cluttered photograph, but detracts attention from the subject of the picture.

In situ photographs can be of great value as in the case of stone artifacts in proximity to the bones of extinct animals. When an object is to be photographed *in situ*, soil, and even dust, should be cleared from the object without disturbing its position. A small paintbrush helps in dusting the subject. Color or black-white-density contrast between the photographic subject and the background presents a problem. If there is little natural contrast, sometimes cross lighting by artificial methods helps. Wetting either the subject or the background may increase the contrast and improve

the picture, but photographs should be taken first of the site in its natural, dry condition.

Field Notes

Field notes should be made which contain reference to each picture and record all pertinent data. These include identification of subject, direction of camera-to-subject line, identification of strata, depth of object from datum plane, designation of quadrant, pit or trench, and in many cases measurements of principal photographic subjects. The field notes should also contain reference to the number or designation of the roll of film or film pack. [When using 35mm film which is relatively cheap, I use the first frame of each roll to photograph a small black-board on which I have written the *film roll number*, date, site data, and other pertinent information to relate the negatives to the field notes. Ed.] As soon as the film has been processed, the field notes and negatives or colored slides should be coordinated and labelled so reference can be made readily to notes and vice versa.

Light

When small objects are being photographed in the field, care must be taken in measuring the light. If the immediate subject is not several inches square or if light can reach the light meter from around the sides of the subject, an overexposed or underexposed picture is likely to result. One easy way to minimize the

Fig. 1. *In situ* photo of stone projectile point partially exposed in lower stratum of cut bank in Stark-Lewis Site, 24GV401. This photo caused authors to require rigid scales.

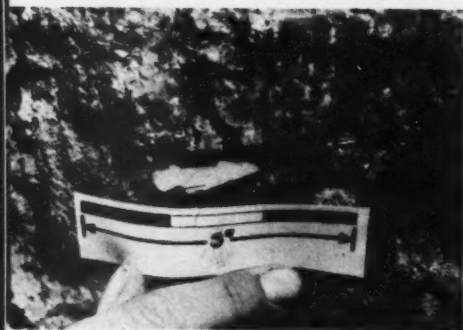
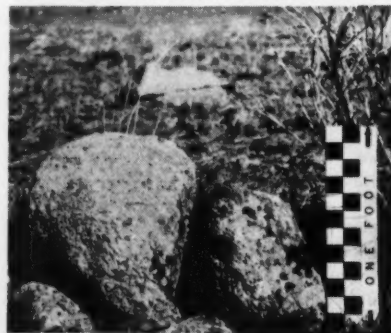


Fig. 2. Close-up view of one of the rock piles in lines of rock piles of Keogh Buffalo Jump, 24ST401. Camera was at height of rock pile to prevent inaccurate reading of scale in photo. This black and white picture was made from 35mm colored slide.



**Denes G. Istvanffy
Stuart W. Conner**

Biographical Sketches

Mr. Istvanffy, the co-author of the series of two articles on archeological photography, was a Hungarian attorney who became an American citizen after World War II. He is an amateur photographer whose salon photographs have been displayed in Hungary, Scotland, Kenya, Canada, and the United States. He is an active member of the Montana and the Billings Archaeological Societies.

Mr. Conner is likewise an attorney, a member of a law firm in Billings, Montana. Mr. Conner and Mr. Istvanffy collaborate on almost all of their archeological endeavors. Conner, too, is a member of the same two archeological societies, and is a director of the Montana organization and past president of the Billings society.

Mr. Conner's reports on the Fish Creek pictographs and the Grinnell Rock Shelter Pictographs shown in some of the illustrations accompanying this article will be published in the *Plains Anthropologist*.

problem is with a few sheets of colored, dull finished art paper. Before reading the meter, a sheet of paper of the approximate color or black-white density of the subject can be laid on the subject and the paper measured for light reflection.

Fig. 3. Meandering lines of rock piles in boulder-strewn field helped confine bison while being driven toward cliff at Keogh Buffalo Jump. Men standing at turns help identify lines in photograph. Illustration made from colored slide.



Fig. 4. Rock lines on one leg of intricate drive lane pattern of Keogh Buffalo Jump have been scattered by cattle. Men standing along line help locate rocks partially obscured by grass. Picture made from 35mm colored slide.

Since a camera records on a flat piece of paper a view which usually contains objects at varying distances from the camera, two hazards are presented, distortion and depth of field. Where relationships, sizes, or objects are to be recorded with precision, the plane being photographed should be perpendicular to the camera-to-subject line and parallel to the plane of the film in the camera. Any deviation from this will cause distortion. Parallel lines will converge and diverge rather than remain equidistant from each other, as in the case of pictures of railroad tracks that seem to merge in the distance. Distortion is particularly dangerous in recording picture writing, stone alignments on the ground and the cliffs of buffalo jumps, each of which is on a flat plane.

Depth of Field

Depth of field is a phenomenon which the archeological photographer may use to good advantage, making clear and distinct, objects at varying distances from the camera, or fading out a nonfunctional background. As a general rule, objects at some distances from the camera will be in focus and others will be out of focus and blurred, irrespective of the lens opening and distance setting. It is often desirable to have objects relatively close and relatively distant, both in focus and distinct. The depth of field, or distance between the nearest and farthest points from the camera at which objects will be recorded with satisfactory sharpness, can be increased by decreasing the lens aperture. Decreasing the size of the aperture requires a correspondingly longer exposure.

The type of lens used affects the depth of field also. A wide-angle lens has a greater depth of field than a normal lens and a telescopic lens has a lesser depth of field. Most cameras now being manufactured come equipped with a depth-of-field scale.

Occasionally it is well to eliminate the background from the photo. This can



Fig. 5. Unusual masked figures of Fish Creek Pictographs, 24WL401, are fast disappearing, but have been preserved for future study by photography.

be done by reducing the depth of field so that everything beyond the photographic subject is out of focus and only an indistinct blur. A telescopic lens will facilitate such a technique because of its relatively shorter depth of field.

Rock Formations

Applying to actual field work some of the principals outlined above, a rock alignment on the ground is most effectively photographed from a high vantage point such as a tree, ladder, nearby height of ground, or airplane. In case of last resort, a photograph may be taken from the height offered by an accomplice willing to let the photographer sit on his shoulders. Unless the picture is taken from directly overhead, there will be some distortion, but the higher the camera, the less distortion. Rock alignments on the ground should be shot from several

Fig. 6. Conical pole lodges believed to have been constructed by now extinct Shoshone Indian Tribe remain near Gallatin Ranger Station in Yellowstone National Park. Note 4 foot 4 inch scale by doorway of nearer lodge.





Fig. 7. Lew Napton, secretary of Montana Archaeological Society, lays out grids for excavation of "Honeymoon Hall" in Tog Hittel's "Blacktail Cavern" near Wolf Creek, Montana. Electronic flash colored pictures by Mr. Istvanffy in this subterranean limestone cavern produced a graphic record when converted to black and white for the archaeological report. The excavation produced small stone figurines, side notched and fluted points or blades of polished, ivorylike bone, and small, unnotched stone points with concave bases.

angles, but some pictures should record the site so that there is obvious separation between the rocks or rock piles, and one rock pile is not the background for the nearer. Whitewashing rocks after they have been recorded in their natural state often helps, and people stationed at various locations or extremities along a rock line will help locate it for the viewer, particularly if the line meanders or is situated in a rock-strewn area.

If a close-up shot of a pile of rocks is being taken together with a scale to show the height of the pile, the camera must be level with the top of the rock pile and the scale situated to the side of the pile. This is so that in looking through the view finder of the camera the rock pile appears on the scale to be the height it actually is. A photograph taken from above or below the height of

the top of the rock pile may create distortion that will result in the pile's appearing to be of a height other than its true height even though the picture includes the scale.

While it is not possible or desirable always to photograph excavations from directly overhead and from the same level as the diggings, every effort should be made to do so as nearly as possible for pictures which are intended to be exact and accurate records. The closer the photographer is to attaining his goal, the less will be the distortion. Some photos may not attempt to record with precision and may be for human interest. In the latter cases, the people in the pictures should never be facing the camera and should usually be posed performing archeological tasks.

Strata or Levels

It will be difficult to distinguish between strata in a photograph if there is little color contrast between them. ["Stratum (plural, "strata") as used in this article is the same as "level" or "layer" as used in Mr. Smith's *Surface Hunter*, elsewhere in this issue. Ed.] This can be overcome by many methods. Irrespective of the technique used, the excavator must first smooth the vertical wall so it is an even plane and not full of irregularities, ridges, holes, and depressions. All edges should, of course, be absolutely straight and all corners square. The excavation should appear as regular and smooth as the interior of a cardboard box. The bottom edge of the higher stratum should be undercut by making a horizontal cut an inch or two deep along the line where two strata meet, and bevelling the upper two or three inches of the lower stratum into the vertical face to meet the horizontal cut. The sun's rays will cast a shadow in the bevelled area that will dramatize the stratum line. A string fastened to nails or sticks driven into the stratum line will also help to identify it.

Picture Writings

Picture writing pecked or scratched into a rock surface should be photographed in its natural state only with side lighting which will create shadows in the grooves which will contrast to the lighted surface. Once photographed in the natural state with cross lighting, if the grooves are so shallow that the shadows are not adequate to disclose the picture with accuracy, the pecked holes or rubbed grooves can be chalked in with white chalk which is available at all variety and many stationery stores. [See

note at end. Ed.] The chalk will not cause damage to the site and will soon weather away. A less satisfactory method when chalk is not available is to wet the rock surface, leaving the grooves dry. Crayons and other substances which will not disappear with a little wind and rain should be avoided absolutely. Under no circumstance should the site be permanently altered by the photographer.

Picture writing painted on a rock surface should never be chalked or retouched or freshened in any manner but one, and that is by the application of a little fresh water, preferably by a spray process. If the paint is clear enough to photograph without wetting, it should not be touched. Sometimes when a picture on a stone surface has become dim with weathering, an even application of water over the entire surface being photographed will bring out the colors so there is a greater contrast than when dry. A few cases are known where wetting brought out faded figures on sandstone surfaces, that were invisible when dry. Better photographic results can be expected when painted picture writing is in open shade and not-exposed to the direct rays of the sun which have a tendency to wash out the colors with glare. In deep shade or darkness, an electronic flash produces fine results when fired from the side to produce cross lighting. To avoid distortion, picture writing should be photographed, if possible, from the height and vantage of the midpoint of the picture panel. In some cases a slightly improved result may be obtained by using various filters adapted to the situation. A pola screen will occasionally help reduce glare and a Kodak (or equivalent of other manufacturer) C5 or B58 green filter may help bring out red paint when being photographed in black and white.

Experience and regret have taught that if the site is not in one's back yard, it may be cheaper and less frustrating where lighting conditions create questions, to bracket the photographic exposure by taking an additional shot one stop above and another picture a stop below the computed exposure, than saving a negative or two.

Some criticism has been received because of the article in *SoM*, April 1961, p. 80, recommending chalking of petroglyphs that were impossible to photograph otherwise. Yet we do know that that method is taught in some colleges and is acceptable in some areas. The reasons for these objections are these: (a) The resulting photographs are actually copies of the chalking and not of the ancient writings, and (b) the chalk is sometimes hard to wash off, if the rock is porous. Both could be true. If it is impossible to photograph the rock engraving itself, is it better to accept chalk picture as nearly like the original

CONTINUED ON PAGE 195



Fig. 8. Serious amateur archeologists were almost too late to preserve on film this intricate red, white, and dark green shield-bearing warrior at Bear Gulch, 24FR2. Note the initials and other scratches of vandals around and on the prehistoric art. Illustration converted to black and white from colored slide.

Photography in Archeology: In the Laboratory

By Stuart W. Conner

AFTER THE EXCAVATION or other activity in the field there must be recording and analysis in the laboratory. One important tool in the archeology lab is photography.

Equipment includes a camera, preferably a reflex type, a tripod, close-up attachment, photoflood or other strong tungsten electric lamps, a light meter, light box, and scale (ruler).

The two main subjects of the archeologist's photographic efforts in the laboratory are documents and artifacts.

Document photography provides an easy way to record and reproduce maps, diagrams, and sketches of artifacts for the report of the investigation. It also can be used for copying photographs of which no negatives are available, pages from books and other publications, and published maps.

Document Photography

The lighting of documents with incandescent light should be from sources near the camera, and never over 45° from it. The sun offers by far the best lighting for document shots. Contrary to the case of artificial light, the sun's rays should strike the document at a 45° angle. If tungsten lights are used, great care must be taken to insure even lighting of the document, for the least variation shows up on the finished product.

To get even distribution of tungsten light, some diffusion of the light is necessary. At least two, and preferably three, large photoflood bulbs in reflectors should be used to photograph a standard 8½"x 11" page. There should be no light on

the back of the document as there may be when artifacts are photographed.

The document must be perpendicular to the camera axis. This can be accomplished by placing the document on a horizontal surface and having the camera above it on a tripod. It can also be done by placing the object on a vertical surface, such as a wall, and aiming the camera straight at it. Unless the document is absolutely opaque, it should be positioned on a snow-white background, such as white cardboard. If there is printing on the opposite side of the document, the printing often will show through as a "shadow." A black background will eliminate these shadows but may lessen the contrast.

When a document is being prepared by the archeologist, it should be executed on thick, dull white paper. If it is drawn rather than typed, heavy lines of India ink are desirable. The paper used in corporation minute books, available in stationary stores, takes both typing and India ink well and photographs to advantage.

If the document does not fit the field being photographed, the edges can be cropped when printing in black and white or masked when taking colored slides.

Especially when using a supplementary lens or telephoto lens, an error of a tiny fraction of an inch in the focus can make the photograph fuzzy and dim. Therefore, the smallest shutter opening (largest "f" number), consistent with the light on the document and the capabilities of the camera, should be used to obtain the maximum depth of field and consequent sharpness in the photograph.

A scale should be used in each archeological photograph. The size of the scale should be adequate to give an idea of the size of the object at a quick glance. To perform its function, the scale and its size must be legible instantly and clearly. The best scale has alternating sections (inches, centimeters, feet, etc.) of dark and light, with the total length of the scale clearly marked on it. Any figures or lettering used on the scale must be large enough, and of sufficient contrast to the background on which it appears, to be legible in the finished product. Many published archeological photographs contain a ruler for a scale, but the figures and lettering are frequently too small or finely lined to be reproduced at the distance or under the light conditions prevailing.

Scales can be made easily on light cardboard with ink. In most cases a scale drawn on white paper using alternating black and white square inches will suffice. Every scale drawing of an archeological subject should have the scale shown on the drawing, so an additional scale should not be necessary in the photograph.

If more than one document or some other object is included in a photograph, numbering the objects before they are photographed provides an easy and precise reference. Many stationery stores have plastic or cardboard letters and numbers ideally suited for numbering objects in a photograph, but the photographer can make his own on small pieces of cardboard or paper.

Artifact Photography

A light table or light box is needed

Photography in the Field . . .

CONTINUED FROM PAGE 194

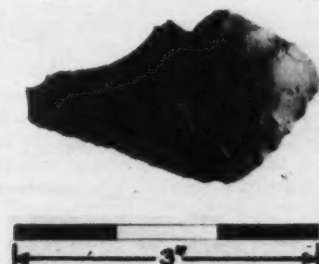
as can be made, or let it deteriorate without recording it at all? In the case of rocks that are not porous, chalk will usually wash off with the first rain, but it must be admitted that in a volcanic ash, removal would require a brush and work, possibly damaging the rock itself.

It has been heard that someone has recommended blowing on a metallic powder, but this is even worse to remove. Perhaps some day an enterprising chemist will come up with a white powder that will be readily soluble and wash off easily. In the meantime, the author's paragraph on chalking is printed as written, but chalking is not recommended by this magazine. Ed.

Fig. 9. Bone projectile point excavated by Billings Archaeological Society from Keogh Buffalo Jump, 24ST401. The point was taken from depth of three inches in bone deposit and overlay stone projectile points indicating its use in latest prehistoric times. Cross lighting emphasizes tiny imperfections in bone surface.



Fig. 10. Gray chert knife excavated from Keogh Buffalo Jump by Billings Archaeological Society. Cross lighting emphasizes depressions and ridges made by chipping.



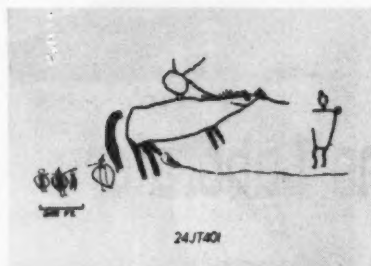
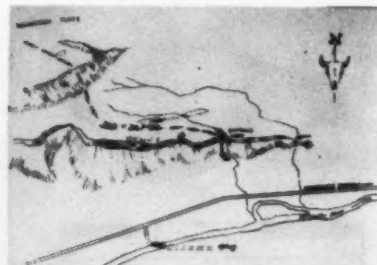


Fig. 11. Photograph of a scale drawing of Grinnvoll Rockshelter Pictographs, 24JT401. This site is the only reported picture writing panel containing contemporaneous drawings of shield-bearing warriors and horses, proving that contrary to previous views, the shield-bearing warrior motif did survive the advent of the horse on the plains. Photographs are an easy way of reproducing scale drawings. (Dr. Wormington in her "Re-appraisal of the Fremont Culture" stated that shield-bearing warrior motif did not survive arrival of horses.)

in artifact photography in addition to the regular lighting equipment. Expensive light tables can be purchased, but for an expenditure of less than one dollar, a mobile, efficient light box can be constructed.

A wooden box approximately 18"x12"x15", imported from Scotland, can be secured free at a liquor store. A little less than one-half of the bottom of the box should be removed. A light bulb socket, obtainable at any hardware store, is fastened to the remaining portion of the bottom of the box. The light should be centered so that it will illuminate the interior of the box evenly. A sheet of frosted, translucent plastic may then be nailed securely to all four sides of the top of the box. It is recommended that two layers of Dupont Mylar film, .003 inch thick, frosted on both sides, be used. Dupont Mylar is not acetate and will take heat of the light better than acetate plastic. Stationery, art and draftsmen's supply stores usually have plastic film or sheet. The bulb socket must have a

Fig. 12. Photographic copy of perspective sketch of Keogh Buffalo Jump by Jim Knight of Billings Archaeological Society. Perspective sketches used in conjunction with survey plats can be of great value in reports when area is too vast to be photographed, as in this case. If printed on high-contrast paper and properly cropped, Figs. 11 and 12 could be made to appear as actual line drawings.



length of electric cord which can be plugged into an electric outlet. A switch is also convenient.

The size of the light bulb in the light box should be no stronger than necessary to eliminate the shadow of the artifact. It therefore will vary with the intensity of the light source from above, the size of the box, and the distance from the bulb to the plastic surface.

The best source of light for photographing artifacts probably is the sun. Often it is impractical to use the sun and it is often difficult to eliminate shadows cast by the sun. However, Dr. Richard G. Forbis, archeologist of the Glenbow Foundation, Calgary, Alberta, uses a sheet of rigid, translucent plastic and sometimes a reflector of aluminum foil to reflect the sun's rays back through the plastic from below to cut the shadow when photographing artifacts in the field.

If one, two, or three small artifacts are being photographed together, one bulb is usually adequate to light them from above. The bulb must be of the proper intensity, proximity, and position, however, and a reasonably sensitive film must be used. One 150-watt reflector spotlight, one 500-watt EBW (ASA code) blue photoflood bulb or one 500-watt EBV (ASA code) white photoflood bulb, positioned 2 or 2½ feet from the artifacts and centered 2 to 4 inches above, will do nicely. With this illumination from above, a 200-watt light bulb is adequate in a light box of the size mentioned.

The color of the light bulb must be coordinated with the film used. Ordinary white bulbs should be used with black and white film and with colored film balanced for tungsten light. If outdoor colored film is used, the light sources must all be blue photoflood bulbs. The bulb in the box must be a 250-watt or smaller, blue photoflood bulb, the ASA code of which is BCA. Failure to use the type of colored film designed to work with the light source used will result in inaccurate color rendition.

If a number of artifacts are being photographed at once, it is recommended that two 500-watt photoflood bulbs in reflectors be placed as closely together as possible and both aimed at the center of the field.

One of the principal objectives in photographing artifacts is to record the surface texture. A light shining straight down on the artifact from above exposes the ridges and depressions equally and the resulting picture will not show the surface texture. A crosslight from one direction only is normally required. The crosslight source must be placed barely above the plane of the artifact. The crosslight illuminates the high spots and makes shadows in the depressions. It accents the texture of the surface so that even tiny imperfections can be recorded

clearly.

If the artifact is rounded rather than flat, two separated light sources may be necessary. They should be placed on opposite sides of the subject and arranged so that they will light the entire surface evenly. The light source and artifact must be adjusted to bring out the more important features of the artifact before the picture is taken. The crosslight should be perpendicular to the direction of the chipping or feature to be emphasized.

A light meter should be used to measure exposure. The light reading must be taken before the light inside the box is turned on. Most artifacts are so small that an attempt to measure the light reflected from them results in the meter's measuring the light reflected by the surface on which the artifacts are placed. This usually results in an over-exposed photo. When the artifact and the light outside the box have been positioned, a piece of dull-finished art paper of the approximate color of the artifact may be laid on the artifact and a light reading made from the paper. After determining the exposure, the light inside the box can be snapped on and the photograph taken.

One photographic hazard is the light from inside the light box. It is impossible to measure the amount of light from below, which floods the surface of the subject being photographed when the inside light is turned on. If too much light comes from below, the object will be overexposed due to fogging. This danger can be reduced by using an interior light that does no more than eliminate the shadow cast by the exterior light. It is also advisable to cover all parts of the light box surface not in the field of the photograph.

The interior light bulb will heat the plastic surface to surprisingly high temperatures, especially if a photoflood bulb is used. The heat will distort plastic letters on the surface of the box and curl paper or light cardboard placed upon it. Safety requires that the interior light be turned on only for a few seconds necessary to snap each picture.

The cardinal rule of all archeological photography applies equally to artifact photography: Include a scale in each photograph. A two- or three-inch scale inked on one end of a 3"x5" index card is adequate for small artifacts.

[Too much stress cannot be placed on the necessity of placing a scale in all archeological pictures. Your photograph may be a pretty picture, but without a scale, the observer has no way of determining the size of the object. Descriptive scales on charts (i.e., 2 in. = 1 mi.) means nothing when the scale is changed by photography. Remember, every time you photograph something, except when photographing something natural size,

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Courtship and Marriage in Modern Africa

By Clifford Sather

THE POLITICAL MAP OF AFRICA is in the process of major revision. Since the war, almost all of North and West Africa have emerged as independent states and much of the rest of the continent will soon follow. For the nations already independent or about to be independent, the problem now is one of assuring a viable economy and enough trained personnel to administer a modern state.

The social and personal life of Africans is also in the process of a profound revision. The problems involved are equally crucial and are even more immediate to the majority of Africans. Most Africans still live in rural areas in tribal societies held together by complex legal, ritual, and moral systems. But westernized towns and cities are growing at astonishing rates and causing repercussions in the traditional way of life. Not only are young people pouring into the towns, but western ideas and products, new aspirations and new standards of respectability are spreading to the countryside.

One area of change is courtship and marriage. Relations between the sexes have changed and incontestable evidence of this is the appearance of "lovelorn" columns in African newspapers. Such columns are especially popular in West Africa. Here they provide a fascinating documentation of changing manners in love, courtship, and marriage.

The following description is of advice to the lovelorn column which appears at irregular intervals of about once a week in the *Daily Mail*, a newspaper published in Freetown, the capitol of Sierra Leone, West Africa. Sierra Leone was a British possession until April 27 of this year and the column, called "Dorothy's Helping Hand," is patterned after similar columns in British women's magazines. The letters seeking advice relate directly to personal problems, defined and described in the author's own words, and like their British and American counterparts, the letters deal solely with the problems of love and marriage.

One difference must be noted at the onset. The letter writers form a select group representing only a small part of the population. They are the educated class, the literates, who read newspapers and can write letters. The literates as a group are the principal agents of change and the social, economic, and political leaders of modern Africa. They are the social innovators, the heads of unions, political parties, and action groups. Their

aggressive, volatile role has often been commented on and contrasted to the stabilizing position of the corresponding educated middle class in the western world.

In the letters, the authors describe themselves and their descriptions taken together characterize the educated group as a whole. The literates live in cities and large towns and have been to school. Over half of the letters came from the single, largest city, Freetown, and its immediate vicinity, an area which contains less than eight per cent of the total population. In contrast to British and American advice columns the letter writers are predominantly men. Over sixty per cent of the letters were written by men, and in Ghana it is reported that men accounted for ninety per cent of the writers to a similar column. This is easily explained by the fact that women in West Africa have less opportunity for education than do men. The literates then are mostly men. Their occupations are in the white-collar category; they are clerical workers, clerks in stores, civil servants, and teachers. Frequent reference is made to travel in going to school or work in different parts of the country, and the educated class is geographically mobile to a degree impossible in traditional, rural society.

The literates live largely outside the matrix of tribal society. They are either from a tribal background or are so called Creoles, descendants of freed slaves with no remembrance of a tribal past. The Creoles were settled in the coastal colony area of Sierra Leone and have been in direct contact with Europeans for more than 150 years, relatively isolated from native African peoples of the interior. But literacy, not origin, is important and the literates form a group united by common aspirations and standards whatever their origin.

Education is central as they have the aspirations of educated people, preferring professional and clerical occupations. These occupations are the most respectable and with them goes a respectable pattern of life, with books, magazines, and European style entertainment, clothes, and furniture. Traditional society, on the other hand, offers no place for an educated man in its system of subsistence agriculture and kinship management.

The transition from one way of life to another is sharp and it can be painful. A literate individual often has non-

literate relatives and many of his most intimate ties are with uneducated people. This can be a source of conflict as a number of letters indicate. In traditional society it was customary for parents to arrange their son's or daughter's marriage, with the groom's parents concluding the agreement by presenting gifts to the parents of the bride. Marriage was basically a contract between families. A number of writers indicate that their more traditionally minded parents or guardians have followed this custom and have arranged their marriage without taking their own wishes into account.

A girl of sixteen writes that her guardians urge her to marry a man of forty, saying that if she refuses they will no longer be responsible for her schooling. The girl adds that her parents are already unhappy about her being in school. A young man writes that he is in love and wants to marry an educated girl but that his guardians have selected a girl for him and to his horror, she is illiterate. For this reason, he says, he could never be happy with her company, and furthermore, he does not want to be passive in choosing his wife. Another man expresses the same feeling: "Ever since I was a boy my parents took it into their heads to earmark a wife for me after our native fashion, you know, which leaves no room for my taste."

Sometimes literates allow their parents to select a husband or wife or do not object to their doing so but are simply unhappy with the choice that their parents make. If an educated man is married to an illiterate girl, for example, she may be a source of embarrassment before his literate friends. Uneducated parents, when they do not seek actually to arrange their children's marriage, often try to prevent marriage with townspeople, revealing a general distrust on the part of the older generation of towns and education.

To the shy and retiring there was an advantage in having parents arrange the marriage. A whole series of letters concerns the new problem of selecting a partner and initiating a relationship. Typically, a man asks advice on finding a girl, confessing that he has a "secretive disposition and dislikes mixing." Along this line, places where men and women can meet have become important and numerous in marked contrast to the situa-

*Much of the material for this paper is from the field work of Dr. Vernon R. Dorjahn, Professor of Anthropology, University of Oregon, in Sierra Leone in 1954-55.

Clifford Sather

A Biographical Sketch

Clifford Sather was born in Sacramento, California, in 1938, and has had an interest in anthropology since his childhood.

Under the Undergraduate Research Participation Program sponsored by the National Science Foundation, he attended the University of Oregon, where, working with Prof. Vernon R. Dorjahn, he wrote the article on courtship and marriage in Sierra Leone appearing in this issue.

At present he is a senior at Reed College, Portland, Oregon, majoring in anthropology. He plans to take his graduate work in anthropology at Harvard University where he will specialize in cultures of Southeast Asia.

tion in traditional West African society where the activities of men and women were strictly separated and there was little chance of contact between the sexes. School, dances, movies, and the office are frequently mentioned. Even church is a meeting place and, in fact, the whole range of economic, recreational, and religious activities is now participated in by men and women together.

A series of letters deals with the problem of selecting a partner. A woman living in a town or city is almost entirely dependent upon her husband for social position and income rather than a larger group of relatives as was the case in traditional society. Letters reflect this dependency and the man is supposed to be "ambitious" and "educated." But women, and men as well, generally weigh personal qualities more heavily, and education, in addition to its prestige and occupational advantages, is considered important in terms of "like-mindedness." According to the letters, "good character" is the most important attribute of a partner. Personal qualities of the husband and wife are, indeed, a more important



matter under urban conditions at least as they exist in West Africa where the couple depends almost entirely upon each other in place of their kindred for emotional support and companionship.

Personal qualities are considered fundamental in selecting a partner. Such considerations of "character" in marriage are new, for in traditional society a husband and wife were not chosen for personal compatibility, and, although spouses often became very fond of each other, a show of too much affection was ridiculed. There was little romantic love, at least as far as marriage was concerned. In striking contrast, a modern townsman writes that he has found a nice girl but not a "girl of my dreams," and asks whether he should marry her anyhow.

Not all men are so romantic; some are more practical and give priority to domestic and culinary abilities. But, alas, not all girls can cook like mother. One woman writes that her boy friend had promised to marry her. "I was so glad over his proposal that I started making him some dishes whenever he visited me. Unfortunately for me, he discovered that I was a bad cook, and he has said that he would change his mind if I failed to improve my cooking."

A large number of letters concerns the threat or break in a couple's relationship stemming from prolonged separation. Such problems commonly arise from the the mobility and frequent transfer required by the new occupations and from going to school in different parts of the country. A number of young men returned from school to find the girls they left behind married or engaged to other men. Four men, in fact, asked whether it would not be advisable to marry immediately the girls that they have found rather than pursue further education.

By far the bulk of the letters involves the presence of a rival, another man or woman. In a typical letter a woman seeks advice because the boy she has been planning to marry for several years has lost all interest in her and is "going around" with another woman. Why infidelity should be considered so serious is partly understandable in terms of the greater mutual dependence of husband and wife which we have already noted. In addition, the mobility, the transient contact, and the anonymity of cities and towns increase the ease and likelihood of infidelity.

The problem of a rival is primarily the concern of women writing for advice and points up some of the most interesting problems of courtship and marriage in modern West Africa. We have mentioned several probable reasons for the large number of letters concerned with the appearance of a rival. Another reason is that men are not expected by most of the population to be completely faithful. This is exemplified by the practice of polygyny

but goes beyond that. Polygyny is still practiced in much of West Africa and will continue to be practiced with the conversion of most of the population to Islam which does not prohibit plural marriage, rather than to Christianity.

Exclusive behavior is not generally expected of the men and is certainly not displayed by many of them. Men commonly ask advice, for example, on how to retain several women or complain that their girl friends are becoming jealous of one another. One man writes, "I find it difficult to keep one lady at a time. I enjoy adding to my stock and changing old ones for new." Another writes that he is in love with two women, but being a Christian, he cannot marry them both, and still another writes that his two girl friends are spending all his money and asks why they are not like girls in Western countries who pay their own way. One man uses more altruistic terms and asks how the problem of "surplus girls" can be solved if a man can have only one.

Women in tribal society did not expect men to be completely faithful to only one woman. Aside from polygyny, extramarital involvement by the man was not grounds for divorce. In towns and cities women have come to depend more on their husbands and to expect exclusiveness, yet the general population does not share their expectations.

The British colonial government encouraged monogamy in Sierra Leone by granting special monogamous marriages which make it unlawful for the husband to take another wife. Nevertheless, it is reported that men often take a second wife regardless of the agreement, and monogamous marriages have been impossible to enforce because of the absence of any disapproval on the part of the general population. Men and society generally still regard a man's relationship with other women as acceptable polygyny. The feeling is expressed by a man who writes that he is a Christian by faith but admits that some Christian rules appear artificial to the people of his village; the emphasis on monogamy they find too exacting.

Traditional West African society placed a high value on marriage and children, and this continues to be reflected in the letters. College and office work are exciting but without marriage and a family, not enough to assure a full life. Many women and men indicate strongly that they desire a family and are "anxious to make a happy home." Several men claim that one could have any woman in Freetown simply by promising to marry her.

In tribal society, a bride was generally brought into the household of her husband's father and surrounded by a large number of her husband's patrilineal kinsmen. She also continued to maintain close

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Primitive Divorce

By Barbara Richards

GROUNDS FOR DIVORCE in the so called primitive African societies described in *African Systems of Kinship and Marriage* (A. R. Radcliffe - Brown and Daryll Forde, eds., London, Oxford University Press, 1950), do not include the modern western concept of romantic love. Fertility, industriousness, and obedience, with good looks a secondary concern, are sought in a woman; virility, industry, and humaneness in a man. Cause for divorce may be found in the lack of any of these attributes, excepting, perhaps, beauty. Other factors involved in divorce claims are adultery, strain caused by competition among wives for a husband's favors, and conflicting loyalties to siblings, children, and marriage partners.

In one society, at least, the Nyakyusa, divorce follows divorce in the case of a poor man who has used the cattle "paid" for his sister, to obtain a wife for himself. He must divorce his own wife in order to pay back the cattle in case of his sister's getting a divorce.

Since children are often counted among a man's riches, barrenness or sterility is a primary cause for divorce. This may be forestalled in some societies by marrying a woman to bear children for a barren woman. In the event of male sterility, one may allow sexual access to one's wives by a brother or friend who has produced many children. Sexual neglect is also a valid reason for divorce among the increasingly high bride-priced Nyakyusa. Here, usually, rich old men are the only ones who can afford to marry, leaving the younger, more impecunious men without wives. This often leads to adultery, elopement, and divorce.

In the subsistence economy characteristic of many African cultures, laziness is almost as disastrous to a marriage as is barrenness. Therefore a woman may be divorced for not doing her share of the work in the garden, or a man for failing to provide adequately for his family, although the latter seldom seems to be claimed.

The cause for divorce considered most valid from a feminine point of view is frequent and severe beatings from the husband. Indeed, this used to be about the only way a Swazi or Nyakyusa woman could win a divorce. This had to be attested to by neighbors, relatives, or friends and the divorce agreed to by the wife's kinsmen. More frequently the woman's father and brothers ambushed

the culprit and beat him in retaliation and as a warning.

Among the Lozi of Northern Rhodesia where loyalty to siblings is dominant, a man will confide sooner in his sister than his wife. Technically a woman whose husband confides in the females of his own lineage more than he does in her has a valid reason for divorce.

Another strain on marital stability caused by conflicting loyalties is found in the Ashanti's social structure. Here maternal devotion is so strong that it sometimes causes arguments between husband and wife and thence leads to divorce.

Competition for the husband's favors and general rivalry between wives as disruptive of marriage are approached differently by the Lozi and the Natal Zulu. The former frown upon marriage of sisters to the same man, since this would be disruptive of the aforementioned strong sibling tie. However, the Zulu encourage such a marriage, believing that the sisters' love for each other will overcome the jealousy of being rival wives and thus stabilize the marriage.

Adultery is considered ample reason for a man to demand his marriage payment back. Disposition of the children born of an adulterous union plays a vital role here. Among the Zulu a woman's progeny belongs to her legal spouse no matter who their biological father may be, and they stay with him in the event of divorce. But in the Lozi culture a child belongs to its genitor. So if a man divorces his wife on the grounds of adultery, he also loses the child.

Once a divorce is granted, other complications arise. Marriage is not just a contract between two isolated people in the cultures cited, but a social institution involving the lineages of two individuals in varying elaborateness.

In the first place a symbolic payment ranging from money to cattle, has been made by the groom and his kin to the bride's family in exchange for rights over her. This must be given back to the estranged husband in most cases. However, if a Yahoo husband initiates divorce proceedings, he has no right to claim the marriage payment. But, if the woman has borne him children, he is entitled to only part of the bride price back, depending upon the number of children and the cultures involved. This can sometimes cause a great many hardships, as in the case of the poor Nyakyusa brother al-

ready mentioned, where a divorce may break up another home. For this reason, among others, a divorce must be sanctioned by the relatives of the divorcee.

Not only does divorce cause a social and economic disruption between the lineages, but the children and other emotional ties are also involved. The father in Nyakyusa, Zulu, Mivila (Central Bantu), and Lozi societies has exclusive rights to the children, with the children maintaining their mother's status in the Zulu family, but falling in rank among the Lozi. In the matrilineal, patrilineal Central Bantu societies, the mother's brother takes the children when a divorce is impending or may indicate his wish for such to take place by coming to fetch his sister's children. However, if the marriage payment is not returned, the father keeps the children as hostages of inferior status. A Cewa father has no rights over his children, but upon divorce picks up his hoe, axe, and sleeping mat and leaves his wife's village.

Although not recorded for the other tribes in this book, Max Gluckman mentions division of crops upon divorce. The Lozi divide the fruit of a joint effort equally. However, the extremely patriarchal Zulu send the former wife home without any return for her labor in the field.

Ideally, divorce should never happen in any of these societies. The Zulu, among whom it was rare but is now becoming more frequent with the breakdown of other aspects of their social system, say that it is destructive of the "relation between a man and his brothers and the family of his wife, which should be permanent."

Another tribe with a formerly low divorce rate, the Nyakyusa, considers that a girl repays her parents for the expense of her rearing by getting married and avoiding divorce so that her "father may benefit from her cattle." Among the Lozi, while divorce is frowned upon, it is more prevalent than among the Zulu and Nyakyusa now than it seems to have been for sometime. Mr. Gluckman, who recorded their social structure, believes this to be a reflection of a kinship system in which sibling* loyalty is paramount and, in fact, that the divorce rate is dependent directly on the kinship system in any culture.

*Sibling, a brother or sister, or someone in a similar status.

Trans-Pacific Migrations

By George F. Carter

Last issue we published an Appraisal of the Kon Tiki Theory by Dr. Lowell D. Holmes of the Department of Anthropology of the University of Wichita, which he had written in 1957 for publication in Oceania.

In the accompanying article, Dr. George F. Carter, Professor of Geography, The Isaiah Bowman Department of Geography, The Johns Hopkins University, Baltimore 18, Md., gives his opinions on trans-Pacific migrations, which the reader will note differ materially from those of Dr. Holmes. Dr. Carter states that this article was written in an hour's time and asks specifically that the readers therefore not hold him responsible for dates, publications, etc. Ed.

WHEN THOR HEYERDAHL SAILED A RAFT across the Pacific he exploded one of the most cherished beliefs of the anthropologists. He proved that such trips could be made. Although it is popular to say that this did not prove that it was done in pre-Columbian times, this overlooks mountains of evidence that it most certainly was. Heyerdahl made his voyage only because no one would admit his evidence, already accumulated, because "they knew such voyages were impossible."

Heyerdahl has tended to see the first peopling of the Polynesian area as coming from America. Later, he thinks, there were movements off the northwest coast of America, first to Hawaii and thence throughout Polynesia. He has tended to minimize the Asia-to-America movements.

The Asia-to-America contacts have been stressed by Robert von Heine Geldern in a whole series of articles. One of the later ones in German, "The Asiatic Origin of the Pre-Columbian Metal Techniques," argues that the influences that were very important in Middle America date well back into the first millennia B.C., and stemmed from the south coast of Asia. He analyzes Chinese influences in the early gold cultures in the neighborhood of Panama. This is followed by bronze influences on the north coast of South America.

He traces the origins of this bronze age influence across Asia to the Black Sea area, a culture that arose there, spread eastward across Asia and influenced all of China and was particularly important in its influences on the south coast of China. He calls this the Dongson culture. A pattern for such an immense expansion is found of course in the great Mongol empires of later time. Due to the roots of this culture being in the vicinity of the Near East, it carried many ideas that were common to that area to the coast of China—and from there to the coast of America.

Although Heine Geldern's principal evidence is in the realm of metallurgy and art forms, he also brings in considerable other data. One of particular interest concerns the pan pipes. These are a series

of tubes, made to be blown over, to produce a series of notes. They were used in both the New World, the Pacific, and in the Old World, and Heine Geldern makes his comparisons with China. There the pan pipes are tuned on a twelve-note scale. The alternate notes on the scale are considered to be male and female; the pipes are played ceremonially in pairs. When so played the two players stand facing each other and are bound together by cords that run from one set of pan pipes to the other. Anyone who is mathematically inclined can play with such figures as this. The results are (for I have had mathematicians in my classes carry out the computations for similar problems) in the order of magnitude of one million to one against chance repetition. Common sense will lead one to a less mathematical but no less convincing similar answer. Yet all these ways of using pan pipes are repeated in Peru!

There is not just one such trait; there are dozens of them.

It is often argued that there are great discrepancies between the chronologies of Asia and America that make impossible such reconstructions as the diffusionists favor. Heine Geldern in his paper has examined these claims and shown that the discrepancies have disappeared since the advent of carbon 14 dating, with its shoving of the early periods in Peru back about 1000 years. The dates of appearance of traits in Peru are now in good agreement with happenings on the coast of Asia.

I have played a minor role in assembling some of the botanical data on trans-Pacific contacts. The bitterest critic of trans-Pacific diffusion died a few years ago, having admitted almost everything that the opposition had been claiming for fifty years—but he went to his grave cursing those whom he had to admit were right. Coconuts, bottle gourds, sweet potatoes, cotton, and some weed species were common to America and the Pacific area and some of the plants were widely spread in Asia and America. The list seems sure to grow as we begin to look more sharply at the data. However, the plant evidence has probably now played

its most important role. It has shown in absolute terms that some voyages were deliberately made by people—made with sufficient speed and ease that they could carry domestic plants with them without spoilage, and without having to eat them to keep from starving.

Now the cultural data seem likely to assume greater and greater importance. Already Harvard University has accepted David Kelley's thesis on trans-Pacific influences. Part of the thesis has been published in the *Southwestern Journal of Anthropology*. In the published section, calendric systems, with their associated mythologies and constellations are discussed. It is concluded that the Middle American and Asian calendars are closely related. Other sections consider myths, and language and reach similar conclusions.

In Dr. Kelley's data, it is the coast of Mexico, and especially the Uto-Aztec speaking peoples of that area that are referred to especially. The linguistic studies are detailed, grammatical and word-meaning association analyses of the highest order of linguistic criticism. It stands as an outright challenge to those who maintain that there are no meaningful linguistic comparisons between Polynesian and American Indian languages. Careful reading of the early papers on Polynesian languages as reported in Heyerdahl's "American Indians in the Pacific" indicates that there has always been considerable indecision about placing Polynesian languages in the same group with the Malay group. Actually, Kelley argues, the language is mixed—but he insists that part of the mixture is Uto Aztec. The total picture suggests a flow of ideas to America with a later return flow to the Pacific.

What, then, are we to make of all this? What does the raft voyage mean? Which is it: Indians into the Pacific or Asiatics to America? Or is it as simple? Is it to or from Mexico, or Panama, or Colombia, or Peru?

My view of the situation is that it is of a complexity that has not yet been more than glimpsed. This is a situation where both Heyerdahl and Heine Geldern and many of the other diffusionists are likely to come out right. Asiatics seem most probably to have sailed to America. They seem at one time or another to have had colonial outposts at varied centers: Panama, Mexico, Peru, Ecuador. Quite expectably some American Indians seemed to have been involved in these trips also.

How might these voyages have been made? Why not on rafts? A Japanese prehistorian long ago concluded that Japanese prehistory began with rafts, that the center of origin of centerboard raft sailing was southeast Asia, and that the sailing rafts of Peru were simply Asiatic sailing rafts. Sailing rafts are still in use

on the coast of Peru. Had Heyerdahl visited the vicinity of Sechura, he would have been able to recruit an experienced crew of raftsmen who could have sailed him to any desired island group—and turned around and sailed him back again. It is one of the wonders of the sailing centerboard raft that with a fore and aft rigged sail it can be tacked and sailed into the wind. It does not have to sail down wind.

Incidentally, de Bischopps built a bamboo raft in French Polynesia and spent six months at sea in great comfort. He had a cook, a pig, and plenty of stores and liquor and would have made the coast of Peru if the boat that came out to look him up hadn't bumped him hard enough to start the by now fragile raft to break up. A better sailor would not have needed six months for the trip.

At some unknown time in history the Orientals began to build better ships. By the time of Christ they were building immense ships. Shortly thereafter they were in contact with Africa, and by 1000 A.D. had a large scale trade going with that continent. How much earlier were they sailing the Pacific? No one knows. The evidence will come from the cultural fields. Chinese goods and ideas and art forms will be the evidence, and we have an awful lot of it now.

Throughout all of this one wonders about the Europeans. Why did they lag so, when they were so much closer? Perhaps it was because they lacked fore and aft sails, and centerboards. But one thing is becoming clear. They did not fail to reach America. A terra cotta head of second century A.D. Mediterranean manufacture has been reported in Mexican archeology, and there are said to be more that are unreported. I hear privately of "dozens of Graeco-Roman lamps" in Middle American archeology. The Italians quarrel about the reality of two plants portrayed in the murals at Pompeii buried toward the end of the first century A.D. by an eruption of Vesuvius. Some think that the plants are the American pineapple and the soursop. An undergraduate student research paper reports a hoard of Mediterranean coins from the Atlantic coast of South America. It all fits. It would fit some of Heyerdahl's ideas too, maybe. Suppose Mediterraneans came here. Could they be the source of some of the White God myths? Would they supply some of the blondes that Heyerdahl insists were present in Middle America? Some Mediterraneans are blonde and some figures found in America portray racial types that certainly appear to be Mediterranean.

When I was a student my mind was closed by the professors. I was told that trans-Pacific voyages were impossible. Only mad men considered them. I have had to unlearn all of that slowly and painfully. For the past 15 years

I have pecked away at the problem, and have gradually become convinced of the enormous importance of the spread of ideas across the oceans of the world on quite early time levels. I get annoyed at those who still hang back and take pot shots at those who have accepted the evidence of diffusion. But then, they get equally annoyed at me. The amateur should find it exciting reading, but he will have to learn to sort facts, assertions, and emotions. And he will have to learn patience. The "final" answers are still decades away, and "the way" will be obscured by barrels of printers' ink.

REFERENCES

- Edwards, Clinton R. "Sailing Rafts of Sechura: History and Problems of Origin," *Southwestern Journal of Anthropology*, Vol. 16, 1960, pp. 368-391.
- Eklholm, Gordon. "A Possible Focus of Asiatic Influence in the Late Classic Cultures of Mesoamerica," *American Antiquity*, Vol. XVIII, No. 3, Pt. 2, 1953, pp. 72-79.

Green, Dee F. (ed.). U. A. S. Newsletter, No. 70, Nov. 25, 1960, "Ancient Trans-Pacific Migration" and other articles.

Hatt, Gudmund. "Asiatic Influences in American Folklore," *Historisk-Filologiske Meddelelser*, Bind XXXI, 1949.

Hatt, Gudmund. "The Corn Mother in America and in Indonesia," *International Review of Ethnology and Linguistics*, Vol. XLVI, 1951.

Heine-Geldern, Robert. *Die Asiatische Herkunft der Sudamerikanischen Metalltechnik*. Traces the metal techniques of South America to the Dongson culture of South China, which in turn derived from the terminal bronze-early iron age civilizations of the Black Sea area.

Heyerdahl, Thor. "Guara Navigation: Indigenous Sailing off the Andean Coast," *Southwestern Journal of Anthropology*, Vol. 13, 1957, pp. 134-143.

Imbelloni, Jose. "Las tabletas parlantes de pascua, monumentos de un sistema grafico indio-oceanico," *Runa archive para las ciencias del hombre*, Vol. IV, Puenos Aires, 1961, pp. 89-177.

Kelley, D. H. "Calendar Animals and Deities," *Southwestern Journal of Anthropology*, Vol. 16, No. 3, 1960, 317-337.

Nishimura Shinji. *Ancient Rafts of Japan*. The Waseda University Press, 1925. An early study of the antiquity of rafts in Asia, suggesting vast antiquity for them, and their diffusion to Peru.

Willey, Gordon R. "Estimated Correlations and Dating of South and Central American Culture Sequences," *American Antiquity*, Vol. XXIII, No. 4, 1958, pp. 353-378.

Large Hawaiian Ruins Discovered

Announcement was made in June of the discovery of Kau ruins in Hawaii, cut out of heavy concealing brush, and known only to a handful of scientists and aids who had worked on the project since last January.

The ruins include a formidable collection of walls in various stages of uprightness from ancient into historic times and extending over an area of nearly seven miles, most numerous between Punaluu and Honuapo in the area where the Kau landscape with its rapid descent from the pahala area levels out into a fairly flat, semifan-shaped shore shelf, with the fan radiating from Mauka Hilea as the pivot.

Site of the ruins is a commanding one. In the Kawa Bay area, about a half-mile off passing Mamalahoa Highway and on the Honuapo side of the Hilea Stream junction with the Pacific over a bar of coarse black sand, they rise from a base which is the surface of a solid pahoehoe lava flow.

Seeing the newly found ruins for the first time, Mr. Pierce described the scene in a front-page newspaper story in these words: "Along the pahoehoe stretch of trail that slopes slightly down to its Hilea crossing, the trail conveys almost the sense of being an Appian Way of ancient Rome, with which it may have been contemporary. It derives a spaciousness from the flat pahoehoe along the shore, and it is paved as the Appian Way never was."

"On the Punaluu side of the stream and atop the seaward crest of the laval

flow, sits Keeku Heiau that never was 'lost' in brush with other ruins of the vicinity. Approximately 60 feet wide and 50 feet long, the heiau is in a varied state of preservation. Some of its walls rise intact. But some have been thrown down, most likely by the heavy 1868 earthquakes that shook Kau.

"However, its paved areas of beach-worn stones, its sacrificial pit, and many other features remain well defined. Situated so its coast end wall drops into the Pacific, the heiau rises just out of reach of the pounding Kau'surf.

"It is entirely possible, authorities are agreed, that the heiau has held its coastal command post for a thousand years, give or take a century or so.

"It is equally certain that the around-the-island trail, over which centuries of barefoot traffic has left ropy pahoehoe sidewalk smooth, has followed its course possibly toward 2,000 years. And it still is used between Punaluu and Honuapo.

"Certainly it is testimony to the solid



The Island of Hawaii, commonly known as the "Big Island." The new ruins area is between Punaluu and Honuapo, with the greatest concentration south of Hilea stream. The other islands of the chain, which together with the Big Island make up our fiftieth state, lie to the northwest. Honolulu, the capital, is on the island of Oahu, the next largest island.

pohaku (stone) engineering of its Polynesian creators who built for the ages. It is more so in view of its survival of 1960 and 1946 tidal waves and 1868 quakes that hit that area, besides no one knows how many others through the centuries."

Dr. Mills said these ruins are "precontact" and "highly possible" to date back to the beginning of the Christian era.

Radiocarbon count from charcoal found earlier through excavations by the University of Hawaii and Bishop Museum, under the direction of Dr. Kenneth P. Emory, at San Point, near the latest clearing, reveal the early date of A.D. 124.

The real significance of these ruins is difficult to estimate at this time without more specific information. It could be tremendous, however. Archeological ruins in the Polynesian area have been comparatively scarce in the past. Archeological material has been limited mainly to the well known stone heads and the cave sites of Easter Island, to stone heads in a few other islands, and to stone altars believed to be of a comparatively recent date. Since most of the house structures were of plant origin, they did not endure long in the tropical windswept and water-swept islands. Stone tools have been very scarce and ceramics nonexistent.

For most of our knowledge of the early Polynesians we have had to depend on the oral traditions and memorized genealogies promulgated by the tahungas or old "wise men" most of whom are now dead. Furthermore, oral traditions and memorized material are never entirely reliable. Finding of ruins as extensive as these could add greatly to our knowledge of the early people of the Hawaiian Islands and of the Polynesians in general. Ed.

Micronesians . . .

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Fragments of the reef are broken off by the waves and carried onto the reef shelf and so an island is finally formed. A typical island has an outer beach of irregular pieces of coral and shell. It has an elevation of from six to ten feet and is composed of coral fragments and covering vegetation. The amount of vegetation depends greatly upon the amount of rainfall. The lagoon is usually composed of small coral fragments and sand. The highest point of the island is normally a windblown sand dune on the weather side.

The ocean side of an atoll is formed of rough coral fragments and shells, but the lagoon side is usually of sand.

The surf usually breaks on the outer reef, but during a tidal wave accompanying a typhoon the entire island may be inundated (see SoM, April 1961, p. 102). There are no lakes or streams, but

swamps and brackish ponds may exist. Usually near the center of the island there is a shallow well of fresh or brackish water which the natives use to supplement that which they catch when it rains.

Coral is the only native stonelike material found in the Marshall Islands. This has had a definitely limiting effect upon the artifacts produced by the inhabitants. No minerals or chemical deposits exist except the minor deposits of phosphate and guano.

Most of the atoll lagoons are shallow. While the bottoms are flat and sandy, generally most of the lagoons are studded with live cones of coral. Kwajalein Atoll lagoon has an area of approximately 1000 square miles, while the land surface amounts to only about ten square miles. The necessity of the inhabitants' being excellent seamen is apparent. There are various passages or entrances to most lagoons. Many are shallow and narrow, but there is usually one good entrance to each atoll from the leeward side. The rise of the tide varies, but normally it is about seven feet.

The fresh water supply is always precarious. The natives have various ingenious devices for supplementing the water obtained from their brackish wells. Rain water is collected from the eaves of the roofs and as it pours from pandanus leaves tied to trees. This water is collected in receptacles made from hollowed tree trunks, empty coconut shells, and now any type of can or barrel. Of course the greatest supplemental source has always been the liquid from the fresh green coconut. This constant source supplies both drink and food.

Fauna and Flora

The interior of the island has a shallow topsoil of sand and humus. If the vegetation has been very thick, the dark brown humus may be several feet in depth. All of the soil, however, is very poor for agriculture. The natives maintain that the soil is so poor that they cannot grow any crops, but we have found that by mixing guano and the best of the humus, and using fresh water for irrigation, vegetables can be produced. The expense is greater than the reward.

Because of greater humidity, the southern atolls produce more luxuriant vegetation than the islands of the north. Perhaps the most numerous of the tree growths is the pandanus (*pan-DAN-us*), but the coconut palm is the most picturesque and the most prominent. The breadfruit is the third most important tree. Of the smaller food plants, the arrowroot has considerable significance. Various foreign food plants have been introduced.

A small brown rat seems to have been the only mammal found in the Marshall Islands when first discovered. Today the European type introduced by ships seems

to be far more abundant. Cats, dogs, mice, pigs, chickens, and ducks have all been introduced.

There are several varieties of lizard. The most numerous is a small brown species with blue and reddish stripes. There are two kinds of large lizards, one black and one brown, that frequent the coconut palms. There are no snakes.

Butterflies, beetles, locusts, dragonflies, mosquitoes, scorpions, centipedes, and the common European housefly have all been noted.

There are a few land birds found in the Marshall Islands. Plovers and sandpipers are perhaps the most numerous. One can see also cuckoo, curlew, turnstone, fruit pigeon, and heron. Even jungle fowl have been reported. The important sea birds are the booby gannet, noddy tern, frigate bird or man-of-war, and the numerous beautiful fairy terns.

The waters are well supplied with fish, and many of them are an important food item. Albacore, tunny, tigerfish, squirrel fish, shark, sea bass, parrot fish, mullet, moray, leatherfish, mackerel, grouper, herring, goby, flying fish, eel, dolphin, butterfly fish, bonito, and barbel are common.

Perhaps the most important shellfish are clams, crabs, crawfish, giant clams (*Tridacna gigas*), lobsters, mussels, pearl oysters, and shrimps, but a great variety of *Crustacea* and *Mollusca* abounds on the reefs and in the lagoons. The large coconut crabs are an important food item. Land snails are common.

Cuttlefish and octopi are caught for food. The eggs of the two species of turtle are sought eagerly. The shell of the turtle is used for making fans and also for a covering for spears lined with sharks' teeth. The porpoise is sometimes seen in great numbers and occasionally a whale is sighted.

This briefly gives the environment of the natives of the Marshall Islands. We shall see how greatly this environment has affected these people and how these early sea travelers made use of the things they found to develop a unique pattern of living.

First People

The Marshall Islands form a part of the group known as Micronesia. On the south they are bordered by Melanesia. To the east they open into a great region of far-flung, scattered islands inhabited by the Polynesians. (See map; also map, back cover, SoM, April 1961.)

In remote times various waves of peoples poured through the Malay Peninsula looking for new and better places in which to live. They were of various stocks, and in many cases mixtures of many different stocks. These included the Micronesians, people who were likely a mixture of Mongoloid and Caucasoid

with possibly an understratum of Negroid and probably Australoid.

Perhaps the earliest man was the Java Ape Man and his relatives. *Pithecanthropus erectus*, however, is still a mystery. Undoubtedly some of the first travelers through the funnel were the ancestors of the Australian aborigines known as Australoids. About 25,000 years ago when the ocean level was lower (due to the fact that more water was frozen around the poles and on heights), humans were able to move from Asia on foot across land bridges into Malaysia.* They were able to reach New Guinea and Australia on rafts or canoes by crossing narrow sea channels. The Australoid group reached the end of the trail and there remained without much contact with others. They are one of the most primitive of peoples existing today.

Later came the Oceanic Negritos or Pygmy Negroids. Remnants of these are still found in the Philippines and in the interior of New Guinea. They were primitive, peaceful tillers of the soil.

The extinct Tasmanians were probably a cross between the Australoid and Negrito stocks. This same cross with a later addition of Indonesian might have resulted in producing the Melanesians. It is the belief of some, however, that the Melanesians represent a separate Negroid migration.

The Indonesians were of Caucasoid stock. They were followed and mixed to a certain extent with the Malaysians who were dominantly Mongoloid.

The Polynesians are similar to the Micronesians, but with more Caucasoid traits. The Micronesians seem to be a mixture of Indonesian with Mongoloid and an understratum of Negroid and Australoid. The only exception to this general statement is that the Micronesians to the west show a definite Malayan influence in physical type.

This is the racial background of the people of the Marshall Islands before contact with the Europeans.

There is another great influence affecting these people. It is the result of their contact with Europeans, Japanese, and Americans. This contact brought a war such as these people never dreamed of. Their first contact with Americans brought diseases which wrought havoc among them.

Early History

Los Pintados was the name given to Marshall Islands during the early part of the 16th century by the Spanish discoverer, de Saavedra. In 1529 Alvaro de Saavedra reported seeing islands which correspond to the northern Marshalls. He gave them the name *Los Pintados*, because of the remarkably tattooed bodies of the native inhabitants. In reality probably his compatriot, Garcia de Loyasa, was the first to sight the islands.

Later in the century, various Spanish

ships sighted and reported nearly half of the atolls of the archipelago. After nearly two centuries, the English captains, Gilbert and Marshall, discovered and rediscovered some of the southern atolls. To the ship *Ocean* (1804) goes credit for the discovery of the Kwajalein Atoll.

Kotzebue, a lieutenant of the Russian Navy, made the first systematic exploration of the islands, and attempted to introduce goats, chickens, pigs, and a number of plants. These were brought from the Hawaiian Islands in 1816 for the natives.

Various Europeans who followed Kotzebue were not as benevolent. At first the natives received the whites with friendliness, but as time went on they became more warlike. Europeans were killed by the natives because of their brutal conduct toward the women. Natives were killed because of attempting to steal. A Japanese junk is reported to have been attacked, looted, and its crew annihilated. The Europeans who were early travelers are never listed as being anything but a rough, wild group, and undoubtedly they gave little consideration to the natives.

Syphilis and gonorrhea were brought to Kusaie by the whalers who made that island their resting place. These diseases were introduced to the Marshall Islanders by two returning members of the noble class and it spread widely over the entire archipelago. Particular havoc was wrought among the aristocratic families. Blackbirding also is reported to have had its day throughout the area. Mostly the natives were taken to Central and South America to work in the mines. One native today maintains that his father married a woman of Peru while he worked there and that after many years his father was able to bring his mother back to the Kwajalein Atoll where they lived until they died.

Prior to the Germans' establishing their protectorate in 1885, the native inhabitants numbered approximately 15,000, but by 1935 the number had dropped by a third.

Native Organization

In the early days, the natives were ruled by clan chiefs, each striving to extend his domain at the expense of his neighbors. Most conflicts were petty, involving only one or a few of the many atolls. Usually war was engaged in to obtain the food from a neighboring island or atoll or to protect the food from raiding parties. Both men and women engaged in these conflicts, using clubs and spears (javelins).

At times, certain chiefs gained control over all or most of either the Ratak or Ralik chain. The native chief, Gemari, is reported to have been in complete control of the Ratak chain by 1823.

Kaibuki, a chief of the Ralik chain, gained fame among his people by leading

them on successful attacks against European ships. Between 1845 and 1870, he gained control of all the Ralik chain with a few exceptions among the northern atolls. Upon his death, his widow married Kabua of Rongelap. Kabua gained the favor of the Germans, but by 1885 Lojak was the dominant chief in southern Ralik. The chief, upon taking over an atoll or island, would entrust it to one of his most devoted followers by making the man headman of the island. The headman was responsible to the chief for his conduct in the administration of the land.

The line of descent for chiefs and headmen was traced through the mother. A man became chief or headman because his mother was the daughter or sister of the former ruler.

During the German regime in the Marshalls, the chiefs retained their power. The German plan was to retain the native political structure and so they conducted all dealings with the natives through their chiefs. This was not true of the Japanese for they greatly restricted the functions of the native political heads by publishing and enforcing various ordinances. They also superimposed an administrative hierarchy of local chiefs and headmen.

Missionary Influence

In 1857, the Boston Mission Society (American Board of Commissioners for Foreign Missions) sent Rev. Doane and his wife to Ebon atoll where a church was built and a start of missionary influence was made. By 1865, a school had been organized for native evangelists. The plan was to establish the native evangelists on the various atolls after they had been trained sufficiently. The Eastern Carolines offered advantages not found in the Marshall Islands so in 1880 the main station was moved from Ebon to Kusaie in the Carolines. Children with aptitude were sent from the Marshalls to the school in Kusaie.

A Jesuit missionary established residence at Jaluit in the Marshalls in 1906. Probably to counteract this influence, the Boston Mission reestablished a residence in the Marshall Islands. This time Dr. C. F. Rife was transferred to Majuro where he established a training school for evangelists. Upon Dr. Rife's departure, the training program was again transferred to Kusaie where it remained until 1914. At that time Miss Jessie Hoppin came to Jaluit from Kusaie and with the help of Carl R. Heine, a German resident, established herself as a missionary. In 1928, the Rev. and Mrs. Lockwood joined Miss Hoppin and continued the work until 1932 when the Lockwoods moved to Hawaii. Miss Hoppin returned to Kusaie in 1933, leaving Heine to carry on the work.

During this period, twenty-two preaching stations with native evangelists were established throughout the archipelago.

Nearly two-thirds of the native population were listed as church members. The church had become the center of all social life, and the people were trying to follow the Christian way of life. True, many of their old ideas and thoughts became fused with the teachings of the missionaries, but no one could discount the great influence of the missionaries' work.

Women wore Mother Hubbard dresses. Men belonging to the church did not smoke. People who committed adultery were suspended from the church. Chiefs were limited to one wife, and marriages were performed by the missionaries. Hard drinking and even blackbirding which had been practiced to a degree were either stopped or very much controlled. There is no question that through the work of the missionaries a good foundation was laid for a favorable reception of the people of the United States. Because of the good work done by the American missionaries, the natives had a high regard for all people of the United States.

Religion

The natives of Kwajalein atoll are now Christians. When first contacted by the American troops during World War II, one of their concerns was whether they could have their church services and worship God as they wished to do. They were permitted and even encouraged to do so. The first little group of people contacted had a venerable old man with them to act as their missionary (preacher). He was nearly blind. During the battle, he had been able to retain his Bible printed in the Marshallese language, and a few hymnbooks. Never will I forget the miserable group of about 30 men, women, and children, old and young, during the trying early days of our military occupation, who were filled with fear, clinging to their religion. They found comfort and help in their church. Meetings were held every day and three times on Sunday. The meetings were usually short. The weekly meetings consisted of prayer, hymns, and often the Lord's Prayer. On Sunday there was a sermon, and sometimes three sermons.

Anyone is permitted to go to church, with certain reservations. A person who follows strictly the Christian way of life may become a church member and later even a missionary, who is really a leader or lay preacher. If a person is wayward and commits adultery, for instance, he is barred from the church for a period of time. If he repents, he may at the end of a week or so come back into the church and be accepted. This, as one can see readily, is vitally important. Here we find that if a person is wayward, he immediately is given social disapproval. This is the most effective means of controlling any group of people. Being out of the important social life which centered

around the church would bring even the stubbornest sinner back into line.

Every village of importance had a church. People from the neighboring islands attended as often as possible and made the greatest effort to attend on Sunday. It becomes evident that great importance was attached to the church. The social control, the center of community interest, the common tie, socialization, and even the school were very closely connected with the church, as it was in our own early history.

Religion Under U.S. Navy Influence

What is happening now? Remember, our military authorities were always giving encouragement to the church. Our Navy was Christian but our religion had become something quite different in many ways from that which we found among these people. Here they were living and practicing a Christianity that existed in the 19th century, not that of our 20th century. Immediately, conflicts began to appear. One was the need of working on Sunday. True, the Navy Civil Affairs Officer permitted the labor battalion to cease work on Sundays, but if the Civil Affairs Officer wanted work done, he did not hesitate to call out men from the church to do his bidding. Even more evident was this fact on the islands occupied by natives. Due mainly to poor timing or lack of consideration of their Sunday, the Civil Affairs Officer occasionally arrived at the native island on a Sunday and immediately called the men from church to unload his boat and do the work that he wanted done.

TO BE CONTINUED

Photography in Lab . . .

CONTINUED FROM PAGE 196

1 to 1, the scale is changed. Therefore, the observer has no idea of size except by comparison. Many fine pictures are received in this office that cannot be used because the size is not indicated. Ed.]

The field of the final picture should exclude everything except the subject, the scale, and a small margin. Care should be taken to restrict the photographic field to the desired dimensions. This will also result in the artifact's being large and more legible in the final picture. The proper combination of camera lenses and supplementary lenses will give a photographic field of the dimensions desired.

As in the case of document photography, the plane on which the artifacts are resting must be perpendicular to the camera-to-subject line. Any deviation from this will result in a distortion of the shape of the artifact. If a supplementary lens is used, great care must be taken in focusing the camera. The tiniest error may result in all or part of the artifact's being out of focus and blurred.

The difference between ridges and depressions in some artifacts is sufficient to throw one part or the other out of focus when a supplementary lens is in use. Again, care should be taken to insure the maximum depth of field by using the smallest shutter opening on the camera which will permit the proper exposure.

Many kinds of colored and black and white film are available. Almost any of them will serve the purpose if used with proper light. High speed Ektachrome for tungsten light has an ASA rating of 125. The sensitivity of the film makes less exterior light necessary and consequently less interior light with fewer problems of heat and fogging due to excess background light.

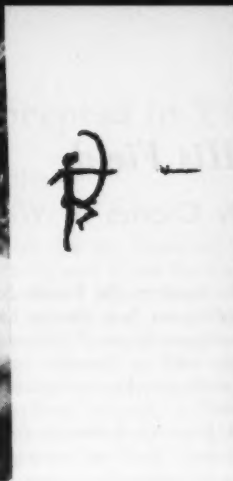
It is desirable to photograph artifacts in black and white for publication and in color for further accuracy and display. When the black and white prints are available, they should be labeled immediately with the site, artifact number, and other pertinent archeological data as well as the negative number and negative roll number if roll film is used. The negatives and colored slides should be stored in numbered or systematic sequence where they are safe from dampness and heat and are readily available. Colored slides should also be labeled with archeological data.

Other laboratory uses can be made of photography, too. A colored slide image projected on a piece of paper can be traced easily to make a scale drawing. By setting the projector two or three feet from the paper, the image will be small enough to trace on ordinary stationery. The scale in the image must also be traced. The hazard of distortion again requires that the tracing plane be perpendicular to the line of projection. A colored slide projected onto white paper with a reasonably slick but not too shiny surface can be photographed in color or black and white. An image on a projection screen is too diffused to photograph properly.

As in the case of every gain in knowledge, better photography can increase your pleasure and appreciation of archeology.

Amateurs Do Help

Not long ago an elderly man who collected Indian relics became, through his hobby, interested in anthropology. He willed his entire estate to a small eastern college, the income from the money to be used for research in anthropological fields. As the estate was worth about 2 million dollars, the income amounts to some \$80,000 per year. The small school probably has more research funds than all but a few of the large universities. Yet some professionals would discourage amateurs!—*Interamerican*.



Kwalhiokwa

Text and Photographs by John Donovan

Of all the Indian tribes in the State of Washington, perhaps the least known were the Athapaskan speaking Kwalhiokwa, who lived on the headwaters of the Willapa River and extended into the upper course of the Chehalis River. (See maps, pp. 161-164, SoM, August 1961.)

They were, as J. Nelson Barry said, "A bold and savage tribe, which wandered in the woods and built no habitation. They subsisted on game, berries and roots."

The name Kwalhiokwa, or Kwalhioqua, comes from the Chinook, their neighbors on the west, and means "a lonely place in the woods." The Quinaults called them Ax we'l a pu, or "people of the Willapa."

The Kwalhiokwa, according to *The Bureau of American Ethnology, Bulletin 145*, were distinguished almost solely by the fact that they were the only tribe of the great Athapaskan group in Washington in historic times, having become entirely isolated from their relatives.

Some think the Kwalhiokwa might have been a subdivision of the Klatskanie who held a sizable tract of territory on the prairies along the upper Chehalis River.

The Klatskanie, upon failure of game, moved to the southern shore of the Columbia River, just upstream from the Clatsops, leaving the Kwalhiokwa as the only Athapaskan-speaking people in Washington.

There were two subdivisions of the Kwalhiokwa:

- (1) *Suwal*, on the headwaters of the Chehalis River, and
- (2) *Wela'pak ate'li*, on the Willapa River.

In 1780, there remained, according to one authority, an estimated 200; but another recognized authority places their number at about 100. However, it is said that by 1850, only two males and several females survived.

Silas Heck, a 90-year-old Chehalis Indian, told me the following story of his

people's accounting of the Kwalhiokwa:

"My mother told me how, long ago, a man came through our country, wandering. His medicine told him to keep looking for a certain place to live. He would move from place to place, looking. Finally, he and his people settled around the headwaters of the Chehalis River, and in the hills of the upper Willapa. We, the Chehalis people, called them *Su su'ni*. My wife, who was a Cowlitz, had relatives among them. She could speak and understand their language, but with difficulty. My mother said, 'They talk like an otter.' I remember one time I bought a typewriter and when I typed a line, I forgot to space between the words and the whole line looked like one word. That's the way the *Su su'ni* talked."

Frank Pete, a prominent Chehalis, told me that his wife is a Nisqually, and her great-great-grandmother was a *Suwal* (the eastern division of the Kwalhiokwa). Thus, due to intermarriage and acculturation, little remains of the once great Athapaskan people in the Pacific Northwest but their artifacts, which may still be found along the upper Chehalis.



Fig. 1. Rainbow Falls on the upper Chehalis River, an important fishing station for the old Kwalhiokwa. Many lamprey eels were caught here.

Figs. 2 - 5. Projectile points on the ground in place, likely those of the Kwalhiokwa.



Archeologist Discusses His Field

By Charles R. Wicke

If, in a moment of weakness, I attend a cocktail party, my hostess is likely to approach me dragging some grinning blonde by the elbow and gush, "Charlie, this is Fuchi Forrester; she's getting a divorce and she just l-u-u-u-vs archeology. Well, excuse me, you two, I have to say hello to Fred."

After a swallow of gin, I clear my throat and begin (in my matchless lecture style), "Well, er, ah, so you like archeology do you?"

"Yes, I just adore it, sir."

"Sir"? God, I'm getting old," I think, "And she in the middle of a divorce, too.") "Why do you like archeology?" I manage.

"Because it's so in-ter-esting."

"Tell me, do you like Egyptian, Sum-erian, Greek, Mesoamerican, Peruvian, Southwestern or what?"

"Oh, all of it I guess," she states, beaming.

As I gulp the last of my martini, I cast a furtive glance for a waiter with a trayful of stemmed oblivion.

Or, a young lady will peek into my doorway at the anthropology office and sweetly call, "I hope I'm not interrupting you, but I wonder if you'd tell me whether this is a fake or not." Without waiting for an answer she swings from behind her a hunk of lava that looks like it could best be employed as highway ballast, and continues, "I bought it from the cutest little Indian boy near Taxco and since he was really an Indian, I'm sure that it can't be a fake."

Stunned by this *non sequitur*, I reach out and grasp the raspy, amorphous blob, turn it over in my hands, giving it the old pro treatment with "um-hum's" even though I could tell it was a simulacrum had I been blindfolded, in a dark room wearing gloves. Finally I summon up enough courage to mutter, "Well, er, ah, my guess would be that it's a falsifica-

tion."

At this, she assumes the female battle station, spreading her feet, placing hands on hips and indignantly, as if I'd smashed it to confetti with a hammer, gasps, "And just how do you know so positively that it's a fake?"

("If she'd gone to a lawyer for an opinion," I muse, "she'd be paying him and accepting his views like dogma. With me it didn't even occur to her that my knowledge should be paid for. Maybe I should tell her that I've been studying this stuff for seven years now, so if she wants to know how I know, she should phone to say that she won't be home for seven years and humbly settle at the feet of the master.") Instead of voicing this, I chuckle, "Oh, I don't, with stone it is hard to be certain. It's just a feeling. Nice piece no matter when it was made."

The reason for such trauma is that nobody knows what an archeologist is, or cares. Obstetricians they know, having come into this world with the aid of one, but who ever needs an archeologist? The cigarette ads help little in educating the public, since archeologists there are depicted hacking their way through jungle, safari and all, in quest of some "lost city." Archeologists in the *New Yorker* cartoons amuse, but do not edify.

If anybody ever asks me pointblank (and so far nobody has) just what an archeologist is supposed to do, I'll answer gratefully, though pedantically, "We seek to discover unrecorded history. Mankind has been on this globe about a half million years; he was writing history only a short part of that. We try to fill in the gaps. Here in the New World we want to find out what was going on before Columbus showed up."

If, after that, my interrogator follows with, "Why?" I'll look him straight in the neck and mumble, "Well, er, ah, also, I guess we just l-u-u-u-v archeology."

The Traveler's Decalogue

American travelers in foreign countries often make a nuisance of themselves, and at times even make themselves obnoxious. Since amateur (and professional) archeologists visiting foreign countries have been known to be as obnoxious as any other class of citizenry, the following "Ten Commandments" are quoted from the *Spotlite*, a Mexican tourist bulletin from Monterrey, Nuevo Leon (October 29, 1959, Vol. VI, No. 206, p. 6).

- I. Thou shalt remember at ALL times that thou art a visitor and there are rules for guests as well as for the hosts.
- II. Thou shalt not raise thy voice in loud clamoring nor shoot off thy mouth in public places.
- III. Thou shalt not pop off in English saying things which are better left unsaid, for her boy friend may have a better command of thine own language than thou, and, justly incensed, may bust thee one of thy teeth.
- IV. Thou shalt not ridicule the coin of realm with such remarks as "What's this worth in real money?" for such cracks will not endear thee to those who labor to make an honest peso.
- V. Thou shalt not make onerous comparisons between what thou findest here and in New York. Thou shalt find many things different and therein lies the charm of the land. Some things thou shalt love—if not, button thy lip and spoil not the trip for thy companion's sake.
- VI. Thou shalt keep a tight rein on thy offspring so that thy little ones may be well loved—but not when they drop waterfilled bags from the second story veranda of thy hotel.
- VII. Thou shalt not, O Lady of gentle breeding, allow thyself to be seen in the streets in shorts or slacks, for such is the raiment of the sisterhood of those with whom thou wish not to be confused.
- VIII. Thou shalt abstain from flashing thy roll in a Daddy-Warbucks-like fashion, for aside from being in bad taste, it is manifestly stupid and potentially dangerous.
- IX. Thou shalt not make an ass of thyself by shrewd bargaining in stores that have fixed prices. But there is no law either which says thou must let thyself be "took" by anyone.
- X. Thou shalt have a wonderful time, rich in pleasures and memories; thou shalt make heartwarming friendships and win amigos for thyself and thy country, by being thyself at all times a good neighbor and according courteous words and friendly smiles to all with whom thou comest in contact.

CONFUCIUS SAYS:



"Behold the tortoise: He maketh no progress unless he sticketh out his neck"

Early Origin of Feathered Serpent in Yucatán

By José Díaz-Bolio*

Introduction

The feathered serpent long has been used as a name or title of Quetzalcóatl, a god of the Toltecs. Just who the original Quetzalcóatl was is not known. It has always been considered likely, however, that there were more than one and the original was lost in antiquity. Just as in certain religious faiths it is customary to name children for the Christian Savior, Jesus, so has it been assumed that among the ancient Mesoamericans, children were named for the gods. For this reason it has been assumed that there have been many Quetzalcóatls, all named for an earlier one.

The last one of this name and the most important to us is Ce Acatl Topiltzin Quetzalcóatl, last priest-king of the Toltecs before the downfall of the ancient city of Tula about A.D. 900. Following the downfall, Quetzalcóatl led his people to Cholula in what is now the State of Puebla. Later he moved on to the New Maya area in Yucatán, spreading the Toltec culture and influence as he went. It seems likely that the many traditions extant are actually a composite pertaining to several different Quetzalcóatls.

His exploits as he travelled would surpass those of Hercules and Ulysses of Greece. Consequently they cannot be told here in this short introduction.

Sr. José Díaz-Bolio, author of many articles on subjects of antiquity, has developed an entirely new viewpoint on this matter. He believes that the feathered serpent (quetzal: a beautiful green bird, native to southern Mexico and Central America, hence "feathered"; and coatl: snake or serpent, called rattlesnake by Sr. Díaz) existed in Yucatán before the arrival of the Toltecs. Ed.

Prior to the promulgation of my new theory concerning the relationship of the rattlesnake to the Feathered Serpent symbol and the ancient Sun Cult and its related chronology, it had not been my intention to discard the prevalent theory that this symbol was Toltec. Likewise I did not doubt the opinions of the scholars and the ancient chroniclers that the cult of Quetzalcóatl did not exist in the Maya area (before the coming of the Toltecs). As my research proceeded, however, and I recognized the stylizations of the symbol, many things became apparent. First,

I realized that the Feathered Serpent did exist there, and it was the main or prevalent motif of Maya architecture, sculpture, painting, and ceramics. With the finding of each new element in the ancient art of the Mayas, my old ideas acquired through books were shattered. Actually the feathered serpent, or elements of it, were found everywhere. Alas, my conclusion was that nothing existed in art but serpents, rattles, feathers, and other features of a feathered rattlesnake.

With this upsetting discovery I realized that I must study the ancient Maya mind objectively, without any of the interpretations that archeologists had given to it.

On studying Maya art directly from the earliest examples available I found that the Feathered Serpent motif was in the Maya area at least 1,000 years before Toltec influence entered Chichen Itza. Most thought that Quetzalcóatl [the Toltec priest-king] was the originator of the symbol and that it existed only in the 9th through the 12th centuries of the Christian era. The more I studied, the clearer it became, that this symbol was much older than the Toltec priest-king, and that it really was of Maya origin. Actually, the quetzal bird and the species of *Crotalus durissus*, which were always represented, were from the Maya area.

Consequently I postulated in my book, *La Serpiente Emplumada: eje de culturas* (The Feathered Serpent: Axis of Cultures), that the symbol, the Plumed Ser-

pent, was already in Yucatan when the Toltecs arrived in about the 12th century. There I showed how chronology, architecture, sculpture, and literature all blended to substantiate this precept. However, since there were no known preclassic sites in Yucatán at that time I based my conclusions on stylizations in palaces and other places and works of art to show that it existed there previously.

Since that time, however, Dr. Willy Andrews, an American archeologist, has identified a preclassic site, *Dzibichaltun*, which was previously unknown. This meant that this site is older than any other known city in Yucatán.

Since Dzibichaltun is near Merida, I went there to study the ruins. Indeed, there I saw the remnant of what was once a gorgeous facade. It seemed to me that it remained solely to prove the existence of the Feathered Serpent in Yucatán before Toltec influence.

The photograph shows two snakes' bodies crossing one another. Two quite realistic rattles as well as four trapezoid stylizations of a snake's rattle string are attached to the bodies. Originally this serpent motif with rattles and trapezoids must have covered the four sides of the temple (which Dr. Andrews has called, "Temple of the Seven Dolls"). There is still visible a fragment of plumage but its location prevented my including it in the photograph. Thus I have the three main elements of the Feathered Serpent motif—snake bodies, rattles, and feathers—at Dzibichaltun, a preclassic site, proving beyond doubt that the Plumed Serpent existed in Yucatán before the coming of the Toltecs.

*Author of "The Plumed Serpent: the Axis of Cultures," "Ancient and Modern Mayas: Proofs of Their Identity," "The Solar Disc Stone Called the Aztec Calendar," and "The Origin of Nahui Olin," all in Spanish.



A section of the decoration of the Temple of the Seven Dolls, at Dzibichaltun, showing the entwined serpents. The wife, daughter, and prospective son-in-law had to help carry in and hold a tall ladder while the author climbed it to take the picture.

Book Reviews



BLACK SAND: PREHISTORY IN NORTHERN ARIZONA, by Harold S. Colton. Albuquerque: University of New Mexico Press, 1960. 132 pp., 30 photographs, 16 drawings and maps plus bibliography and index. \$4.00. Reviewed by Iola Roberts.

In this interesting book, the author traces the life history of the Sinagua tribe before and after the tremendous activity of the volcano, "Sunset Crater," in Northern Arizona.

A poor tribe was actually enriched not only by the alluvial cinder deposits for farming but also by the presence of the other peoples it brought into their everyday existence.

Five other tribes, the Kayenta, Hohokan, Prescott, Mogollon and Cohoia, influenced its civilization. From them, its people learned new arts, crafts, farming methods and carried on commerce. They traded for the supplies they themselves could not produce or make or that were readily obtainable within close distance. The Sinaguas learned new ways from the newcomers who were gradually absorbed by the tribe. This in turn caused overpopulation resulting in starvation and the gradual moving of the Sinaguas into other regions.

Enough distinct evidence of their lives has been found that archeologists can reconstruct their homes from pit house to pueblo, get a glimpse of their religious rites, games, farming, pottery and basket making and the routine of everyday living.

The work of Doctor A. E. Douglass and his system of dendrochronology has been an aid in dating of the Sinagua and other nearby sites. Through it, a more accurate chronology has been established for the ruins in northern Arizona and elsewhere in the southwest.

ARCHAEOLOGY IN THE AMERICAS, Mary Elting and Franklin Folsom. Reviewed for scientific accuracy by Dr. J. Alden Mason, III. by Kathleen Elgin. Harvey House, Irving-on-Hudson, N.Y. 160 pp. Index. \$2.95.

Though this really splendid book is written primarily for children, it would be a good introduction to the story of archeology in the Americas for anyone. Written by a husband-wife team who are veterans in the field of children's books, the text never "talks down" though it manages to keep a most admirable simplicity and clarity of statement. It would be difficult to find a book which presents so much information, so correctly and in such a delightful manner. We have read

it with delight and recommend it unreservedly.—*Interamerican*, June 1961.

BOOK OF AMERICAN INDIANS, by Ralph B. Raphael. New York, 17: Arco Publishing Co., 1960. 144 pp., 300 illustrations, \$2.50. Book announcement by publisher.

From the very beginning of European contact with America and increasing through the intervening centuries there has been widespread interest in the American Indian and his way of life. Now, with the great influx of western and early American history stories, fact and fantasy, on our television screens, the desire to know more about these original Americans is greater than ever before. To bridge the gap between scholarly ethnological treatises and the Indian myths propagated by television and movies, and to provide a readily understood, authoritative text, Arco is reissuing the famous, "Book of American Indians" by Ralph B. Raphael.

"The Book of American Indians" tells a story that is both fascinating and profound, somber and heartening. While parents will learn from it they will be giving their children a scientific background which will yield plentiful intellectual dividends. With over 300 valuable never-before-published photographs and illustrations, thousands of folklore and historical facts and stories, presented in readable, intriguing language, the story of the American Indian is presented from the Indians of prehistory (and their routes from Asia) to the Indian of today and his reservation. No phase of their history is overlooked either in text or illustration.

There is much to be learned about the influence of the earliest of the peoples to reach North America on our own culture. Their story is here in "The Book of American Indians." More than enough facts, myths and stories to please any student or lover of American history.

PEYOTISM AND NEW MEXICO, by C. Burton Dustin. Farmington, N.M.: C. B. Dustin, 1960. 52 pp. Excellent photographs in black and white. Reviewed by Iola Roberts.

This book endeavors to bring both sides of peyotism clearly into focus, and is particularly good for those with no previous knowledge of the subject.

No certain time can be established when the use of peyote was first started by the Indians of the Southwest. Spanish explorers arriving over four hundred years ago found the Aztecs using it in Mexico for medicinal purposes. The other early records report its use in 1631 among the Queres (Keres), Tano and Towa groups of pueblos and in 1680 its being brought by an Isleta Indian from the Hopi people.

The origin of the ritual is attributed by legend to a lost Lipan Apache woman and her daughter. A voice directed them to eat of the plant and when they had done so, an unknown power directed them back to their tribe safely. In gratitude, the mother started the ritual and the religion which has sprung from it.

From inquiries made and facts presented, its use seems to be more prevalent among the Indians of the southwest than any others but has been used by a number of other tribes. It spread throughout this country and into Canada. One reason advanced by the author for its quick pace is that modern civilization has encroached upon the old ceremonies and traditions of the past and peyotism offers a substitute.

Its legal aspects have been argued *pro* and *con* with the consensus of opinion being that peyote is not a narcotic and is not detrimental to health as used. An Indian religious group, the Native American Church, which uses peyote as a part of its ritual, is fighting hard to have all laws against peyote declared unconstitutional.

The appendix carries an excellent description of the Navajo peyote ritual and photographs of the Fort Battleford (Canada) ceremony. The latter was observed by an eminent psychologist who ate some of the peyote and recorded notes covering the entire ritual.

New Explorations in Puebla

The Tehuacán Archaeological-Botanical Project of the R. S. Peabody Foundation for Archaeology of Andover, Mass., under the direction of Dr. Richard S. MacNeish, chief archeologist of the National Museum of Canada, announced some of the more significant results of its archeological findings in the Tehuacán area of Puebla, Mexico, during the first five months of this year.

1. By excavation of stratified caves and by exploration of 148 sites, a complete sequence of ancient cultures from 9,000 B.C. to A.D. 1500 has been established. This is one of, if not the, longest unbroken cultural sequences known in the New World. Further amplification of it by laboratory analysis will yield crucial information on the rise of civilization.

2. The project is primarily interested in the origin of New World agriculture and its spread. It now can be stated that the ancient inhabitants of the Tehuacán area used *calabazas* (squash) before 6,000 B.C., and domesticated corn, the staff of life of the New World, in the period between 5,000 and 4,000 B.C. The preserved corn cobs found in the cave layers revealed an interesting evolution from long cobs, one per stalk, that in the past were wild, to three cobs with tassels in one husk at the end of the

stalk, to hybridized forms, to the ancestors of many modern varieties. The study of these by botanists will perhaps result in new varieties or increased production.

3. Most of the cultures of this long sequence have preserved food remains or vegetable refuse. From this material it may be possible to reconstruct the ancient economic changes and perhaps be able to discern how this affected the rise of the first villages and ultimate civilized urban centers.

4. Besides these more scientific results the expedition has uncovered a number of archeological firsts—the first woven archeological gauze in Mesoamerica, the first Mesoamerican sandals (one almost good enough to wear though it is 2,000 years old), the first archeological bark cloth along with a bark beater which is complete with handle and cord, woven baskets 2,000 years old, beans so well preserved that they look ready to eat, evidence of dental diseases 2,000 years old, evidence of gigantic irrigation projects, as well as many other results.

The project scheduled for three years in the southern Puebla-northern Oaxaca zone although under the auspices of the R. S. Peabody Foundation of Andover, Mass., is supported by grants from the Rockefeller Foundation and the National Science Foundation.

The Project is working in direct cooperation with the *Instituto Nacional de Antropología e Historia de Mexico* and is collaborating with studies of the Department of Prehistory, directed by José Lufz Lorenzo.

Archeological reconnaissance, under the direction of Fredrick Peterson, has resulted in the finding of more than 140 archeological sites in this previously unexplored area. These sites range from ancient temporary camps to cities of considerable evidence suggesting a much greater prehistoric population in this region than at present. Several other caves have been uncovered for future excavation. Future reconnaissance is expected to reveal several hundred more archeological sites and a number of other caves.

Dr. Melvin Fowler of the Southern Illinois University was in charge of the excavation of Coxcatlan Cave found by Dr. MacNeigh in 1959. He and a crew of twelve uncovered 18 ancient floors, one atop the other. A number of cultures are represented in these floors. The earliest one, called Ajureado, occurred in Floors 1 through 3 and contained projectile points like those found with the mammoth bones in the Valley of Mexico. In our cave these people were half hunters and half plant collectors and probably occupied it from 9,000 to 7,000 B.C.

The next four floors contained artifacts of a new culture called "El Riego," which are believed to have existed from 7,000

to 5,000 B.C. These people were basically plant collectors but they did use domesticated squash. Their culture is characterized by a large series of crude choppers, scrapers and stone bowls or mortars. The projectile points are mainly stemmed but also occurring are some Yuma points common in the Great Plains area.

The next three floors had remains of the "Coxcatlan" culture, from 5,000 to 2,500 B.C. These were the people who first domesticated corn and in their later stages added beans, amaranth, and squashes to their food collecting. Above these remains there seems to be a gap in our sequence, with the next occupation occurring around 800 B.C. Here was found definite evidence of agriculture, ceramics, cotton cloth, and figurines.

The next four floors occurred during the Classic Period and included pottery, sandals, baskets, woven cloth and an even wider variety of domesticated plants. The top three floors are Postclassic or in time, A.D. 800 to 1500. They contain bark cloth, woven textiles, polychrome pottery, stamped pottery, and abundant evidence of intensive agriculture.

The other cave called "El Riego," was excavated by Angel Garcia Cook. [Do not confuse this cave with the one previously mentioned in which evidence of the El Riego culture was also found.] The earliest remains are not unlike those of the Coxcatlan culture in the previous cave, in terms of projectilelike points, mortars, manos, and scrapers. Some of these earliest materials may be slightly younger than previously found, existing from 2500 to 1500 B.C. The next set of materials, as yet poorly defined, contained pottery and evidence of agriculture, and may belong to the period from 1500 to 1000 B.C. Over it are remains that may be Middle Formative from 1000 to 500 B.C. and there are definite materials of the period A.D. 500 to 1000. Above these remains are a series of pits containing Classic and Postclassic materials with abundant evidence of agriculture, many finely woven fabrics, wooden tools, shuttles, needles as well as a complete bark beater.

The third major project has been in terms of laboratory work under Miss Toni Nelken. Not only is this making it possible to define the archeological cultures, but also special sets of material are being separated for study by various consulting experts. Grains of pollen have been given to Miss Monica Bopp of the *Instituto Nacional de Antropología de Mexico* in order to discern the climatic changes which have taken place during the occupations.

Mr. Peterson is the author of "Lost Cities of Chiapas" and "Serpents, Swastikas and Indian Chiefs" which appeared in *SCIENCE OF MAN* and numerous other archeological publications on Mexico. (See *SoM*, Feb. 1961, p. 52; April, p. 91. 120; and Aug., p. 176.)

Africa . . .

CONTINUED FROM PAGE 198

ties with her own relatives and visited them often. The young men and women in the towns and cities of West Africa have usually left their relatives behind and come to live alone. This has made husbands and wives more isolated and more dependent upon each other for emotional and economic support. Women deserted with children are in a particularly serious situation as there are no welfare agencies to replace the group of kindred as a source of assistance. In all of this, the woman's situation is complicated by the polygynous outlook of some men and the absence of disapproval of such an outlook on the part of society generally.

At the time this article was written Sierra Leone was a British colony and protectorate. It was later scheduled to become independent on April 27, 1961, just prior to which time the author wrote saying, "Like the rest of British West Africa, the country is prepared for independence and the transfer of power should go off 'without a hitch.' Sierra Leone will be a member of the British Commonwealth, as are Ghana and Nigeria already." Ed.

REFERENCES

1. Dean, 1957, pp. 168-9.
2. Jahoda, 1959, pp. 177-90.
3. Little, 1951, chap. VII.
4. Mair, 1953, *passim*.
5. Little, 1959, pp. 65-82.

BIBLIOGRAPHY

- Banton, Michael, 1957, *West African City*, Oxford International African Institute.
- Dean, Vera Michéles, 1957, *The Nature of the Non-Western World*, A Mentor Book. New York.
- Jahoda, Gustav, 1959, "Love, Marriage, and Social Change: Letters to the Advice Column of a West African Newspaper," *Africa*, xxix; 177-90.
- Lewis, Roy, 1954, *Sierra Leone*. The Corona Library. London: Her Majesty's Stationery Office.
- Little, Kenneth, 1948, "Social Change and Social Class in Sierra Leone Protectorate" *The American Journal of Sociology*, 54: 10-21.
- 1951, *The Mende of Sierra Leone*. London: Routledge and Kegan Paul.
- 1959, "Some Urban Patterns of Marriage and Domesticity in West Africa," *The Sociological Review*, vii.
- Mair, L. P., 1953, "African Marriage and Social Change," in *Survey of African Marriage and Family Life*, Arthur Phillips, ed. Oxford: International African Institute.

Pleistocene Lakes

Mineral Information Service, a publication of the California Division of Mines, in its April and May (1961) issues published an article entitled, "Pleistocene Lakes in Southeastern California," by Robert P. Blank and George B. Cleveland. Besides describing the area well, the article was illustrated with maps of the Inyo Mountain, Mojave Desert, and Death Valley areas, showing the old lakes in those regions. The map should be a great aid to archeologists, who are not well acquainted with the geology of the area, in locating the sites of early Man around the lakes that no longer exist.

Surface Hunter

by Arthur George Smith

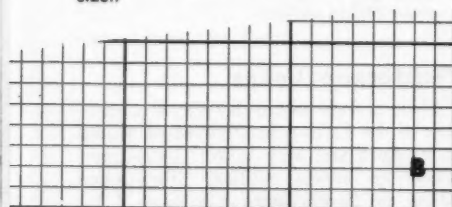


Sooner or later every amateur has a longing to do some excavating himself. This is fine, for digging is a certain way of separating the curio collectors from the amateur archeologists. As a rule you can pick up ten times as many artifacts from the surface in the time spent as you will find digging. Digging is a slow and tedious job if done *properly and this is the only way it should ever be done.* The real amateur archeologist wants to know all he can learn about the past history of his area and about the peoples that preceded him there. He can never do this if he digs unsystematically. His only results will be to ruin the record of the site and make it impossible for anyone to unravel it.

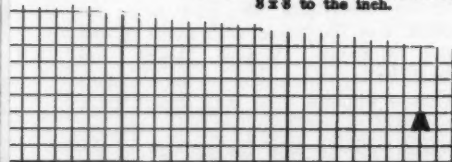
Before you start to dig, there are preliminaries. First, you must have permission from the landowner. Second, you must survey the site and spot it on the map so the record will not be lost. If you can obtain a U.S. Geological Survey map of your area, do so, as it is the best. You may be able to procure a county road map from your county engineer. If none is printed, the county engineer will let you copy his. In any event, use the best map available and locate your site as accurately as possible.

Your equipment is next. If you have or can borrow a hundred-foot steel tape, it will be a great help. If you can't, a hank of strong string and a stick cut five feet long, or an ordinary five- or six-foot folding rule will do. You will want a pad of cross-section paper. In

Fig. 1. Many kinds of cross-section or graph paper are on the market. **A.** Shows the type that has ten lines to the inch with each tenth line heavier. This is the type recommended by Mr. Smith. **B.** Another type with eight lines per inch. Twelve lines to the inch would be best if it can be found. It would correspond exactly to a foot of 12 inches, if you used an inch on the paper to represent a foot on the ground. (Natural size.)



KEUFFEL & ESSER CO., N. Y.
8 x 8 to the inch.



KEUFFEL & ESSER CO., N. Y.
10 x 10 to the inch.

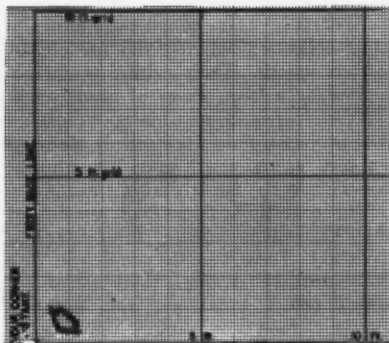


Fig. 2. Lay out your two base lines on the ground and on your paper with the grid lines at five-foot intervals.

the field I use sheets made for a three-ring binder with a printed grid of 70 one-inch squares, each divided into 100 smaller squares. (See Fig. 1.)

The boundaries of the ordinary site are usually rather hazy. If you are lucky enough to have a site defined by blacker dirt in a field, it is easy to plot on your map. You can either measure it with your tape or step it off and convert that into feet. Then, on your grid paper lay it out to some scale and sketch in the boundaries. To one side put an arrow showing north. At the top of the sheet put the name of the site and the date.

Pinpoint the Site

Decide what part of the site you want to dig. At one end of this area drive in a heavy stake as a base point. (Leave this in place but drive it down to ground level when you are through.) Spot this stake accurately on your sketch map of the site. (See Fig. 2.) Now you are ready to lay out the grid. From this base stake, lay out a base line by using a strong string between two stakes. Along this line drive in small stakes exactly five feet apart. I recommend Army pup tent wooden pegs for stakes or you can make your own.

Next lay out another line from the base stake at right angles to the first. A right angle is constructed easily if you remember the Pythagorean theory and construct a right-angled triangle with sides of three and four units, respectively, and with a hypotenuse of five units. (See Fig. 3.)

Stake out this line at five-foot intervals. Then from each stake run a line parallel to the base line, staking it at five-foot intervals. Your grid is now laid out on the ground.

Plot the outline of this grid on the sketch map of your site. (Fig. 2.) Your preliminary map is now finished. Next, plot your grid on another sheet along the ruled line, one heavily ruled square for each five feet on the ground. Number these squares. As you finish digging each square, check it off your sheet and locate any features found such as hearths, trash

pits, postholes, burials, etc. Don't forget to put the data about the site, etc., at the top of the sheet.

Now label another sheet, adding the words, "First Level." In the center of it mark a square five heavy squares on a side. This is a scale map of a square. Note that the fine squares are tenths, so if you can get a folding rule that has feet and tenths instead of feet and inches, you will make things easier for yourself in plotting your finds on this scale map of the individual square.

Starting a Dig

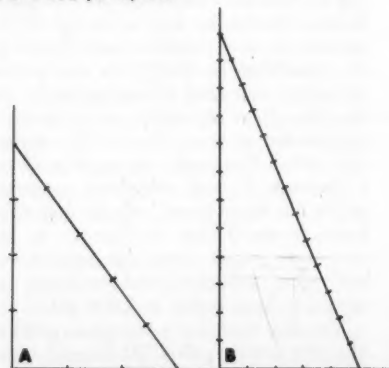
If the site has ever been plowed, that portion of the ground down as far as the plow has ever gone, I call the plow zone. The bottom of it I call the plow sole. Nothing in the plow zone is in its original place so there is no need to spot the finds on the sheet. Mark it, "Plow zone." Put your finds in bags labeled, "Plow zone."

Remember that you *never* discard anything in the field that could give information. Except in cases where you are working in a shell heap, save everything—bones, pieces of bones, artifacts, chips, shards of pottery, pieces of worked bone or stone, shells, etc. If, on the other hand, you are working in a shell heap, you may want to save all shells from one marked square and then not bother with them in the other squares. Otherwise, *save everything.*

If you are digging in a shell heap, be sure to put your shells in a separate bag or basket so that a conchologist can check the shells for species and percentage of species. Shells can tell a lot about what the climate was like at the time the shell heap was being formed.

Once you are under the plow zone, start a new level making a properly

Fig. 3. Constructing a right triangle on the ground or on paper that is not cross-sectioned. **A.** Illustrates the Pythagorean theory: one side is three units, the other side four units, and the diagonal (hypotenuse) is five. **B.** Illustrates a similar construction using 5, 12, and 13. This may be used in a narrow strip of land. Instead of numbers 3, 4, and 5, or 5, 12, and 13, any multiple or fraction of those (or any unit of measurement) may be used: 6, 8, and 10 ft.; 1½, 2, and 2½ yards, etc.



headed sheet for it. Take the dirt out in definite layers of three or six known as levels.* Use a separate sheet for each level until you reach sterile subsoil.

Take copious notes. Write down everything you see in the soil. If you find an artifact, do not lift it; leave it alone until you are through with the level. Spot it on the square map, allowing it to remain on a little column of dirt.

Notes - Notes - Notes!

When through with the level, take a photograph if the finds make it worth while. To spot your finds on the sheet, measure from two sides to the nearest inch or tenth. On a properly dug site with proper notes, it would be possible to put back everything found to within an inch of its original position. Take your time, make full notes of what you find as you dig.

It is a good idea to take someone along as the recording secretary in charge of the pencil and notebook, but I have found that it is difficult to keep the person on this job. After a while he wants to dig, himself. *Keep full notes*; don't trust your memory. Each shovelful of dirt in the site is a page from the book of history and you will have only the one chance to read it, so read it thoroughly. If you dig and keep your notes conscientiously, your work will be as valid and valuable scientifically as the work of the best professionals, and better than that of a lot of them.

Tools

Now to dig, you need tools. A flat, square nosed shovel is good for skinning off topsoil and for backfilling when you are through. As a small hand tool, you need a mason's pointing trowel. This is the diagnostic tool of the true archeologist. You need a grapefruit knife, the kind with one smooth edge. If you can't find one, grind the teeth off one edge of the commoner kind. You need one smooth edge because the teeth will scratch and damage bone, but the saw edge cuts finely packed sand or clay better than the smooth edge. You need a whisk broom and a couple of two-inch paint brushes for brushing off dirt and cleaning up before photographing. You need a pair of tweezers. A pair of stamp collector's tongs are best. These are for picking up tiny bones, beads, or fish scales. In my own digging kit I carry an old soup-spoon, and an Army intrenching pick, also a pair of long-handled pruning shears for cutting roots in the ground.

Packing and Labelling

You will need plenty of tough small bags, a box of cards or labels, packing material (although in emergency you can use dry grass or leaves), small boxes, and cardboard cartons of various sizes. You should have at least one in your kit big enough to hold a skeleton, which means about 26 inches long. I find that canned

soup cartons are ideal. I use them for storage boxes for bones.

You will want a set of cards carrying big numbers to use while taking photographs, for identifying each picture, also cards bearing inscriptions such as "Burial," "Level," "Pit," "Hearth," etc. You will need at least two clipboards, one for your maps and one for your notes. And, you will want some lead pencils. Ink-pencils or pens are taboo—your notes run if the paper gets damp. For your own comfort, take along a couple of old cushions to kneel on.

A screen made of quarter-inch mesh is often handy. Mine is on legs, with handles for shaking. It comes apart and packs flat, with the legs inside. I can pack the rest of my digging kit in it. Two or three screw-topped glass jars with some lead foil to wrap them in may be added if you intend to take samples for C-14 dating. Do not handle charcoal for testing with the fingers. Use tweezers or tongs.

In my future columns I will talk about the proper ways to get profile records, how to take out a burial, how to dig out trash pits, how to remove crushed pottery vessels, and a few tips on taking pictures.

Footnotes:

1. Be sure you are qualified to dig, both educationally and legally. On Federal land there are Federal permits needed; on State land there may be State permits needed. To get these you must have the proper background. Better check with local curator of anthropology or archeology, or the nearest department of anthropology before you start.

2. In some areas where native diggers are used, the shovel blade is used as a measure of levels. Actually the use of any measure is an artificial means of determining levels. The use of natural levels, a hard packed layer (dirt floor), a lime or charcoal layer, or any change in the nature of the soil, is better than artificial levels. These two types are known as natural and artificial stratigraphy.

Extracts from

News Letters



Members of the Southern California Archeological Society are excavating in an area soon to become a housing project. Several almost complete bowls "of mica" [?], three long narrow manos, a good bone awl, chippings, hammerstones, cracking stones, large and small points, are the results of one day's excavations.

From the *San Bernardino Sun* comes this information from Lubbock, Texas. The skeleton of a pipe-smoking Indian was found in an isolated canyon grave near the town. A Texas college professor of anthropology [not named] estimated the body to have been buried five to seven hundred years, yet the pipe of a marblelike stone still had the charred tobacco undisturbed in the bowl.

Squaw grass, according to a report quoted from *Sunset*, was a valuable household article to the Indians who lived near where it grew. The narrow three-foot-long leaves were pliable and strong,

and could be woven into a watertight basket, rain hats, and poncholike rain-coats. From its roots the Indians obtained tubers which, when boiled, made a soap. When roasted, the roots made a baked-potatolike food, though not as tasty.

Fossils and artifacts have recently been found on a section of the Irvine property near Costa Mesa, California, thus opening a new site for both amateur archeologists and paleontologists. Although the property has been sold for a new beach inn and motel, permission has been granted for some excavation. Ages of the fossils has been variously estimated from 15 to 20 thousand years up to 2 million. Some of the large pieces are from an unknown sea mammal. The artifacts are from early shell mounds for which no estimated age has been given.

In ancient times, Indian mothers in San Joaquin Valley attached a piece of soapstone to their cradleboards with a thong. When time to powder the baby, the soapstone was scraped with a piece of flint holding it over the baby until he was well powdered.

Among the legends of the West, one of the most romantic is the story of the Apache tears. According to the legend, a band of raiding Apache warriors encountered an American Army detachment and a fight ensued. In the battle many Indians were killed and the next morning Indian squaws came to look for their dead. When the bodies were found, along with them were their tears which had turned to stone. To this day the Apache tears remind us of the unnecessary grief resulting from a useless killing.

From *El Mescho*, June 1961, San Bernardino County Archeological Society, Mrs. Lola Roberts, Editor.

Apache Tears

Another legend of the Apache tears is quoted from *Rock Talk*, the official publication of the Tucson Gems and Minerals Society.

"Apache tear drops is a legendary name given to those stones by the Indians of the Apache tribe of central Arizona. The gateway to a great mineral district is a towering mountain with sheer cliffs that rise out of the desert floor, known today as Picket Post Mountain. It was on this mountain that the Spaniards cornered a party of Apache warriors.

"To be captured meant to be a slave for life in the Spanish gold mines. The Indians chose death. Later when the squaws came to gather the broken bodies of the brave warriors, a voice in the breeze whispered, 'Thy bitter tears shall be turned into beautiful stones for I should not have made these cliffs so high.'"

Still more information picked up from an unknown source indicates that true Apache tears have a tear-shaped inclusion in the center. It is from the inclusion that the stone gets its name.



Fig. 79.



Fig. 80.

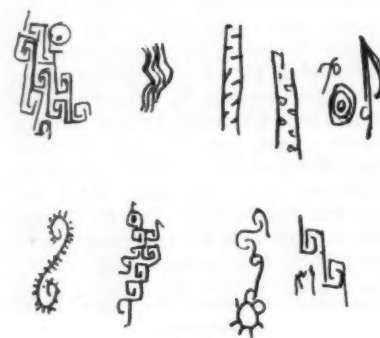
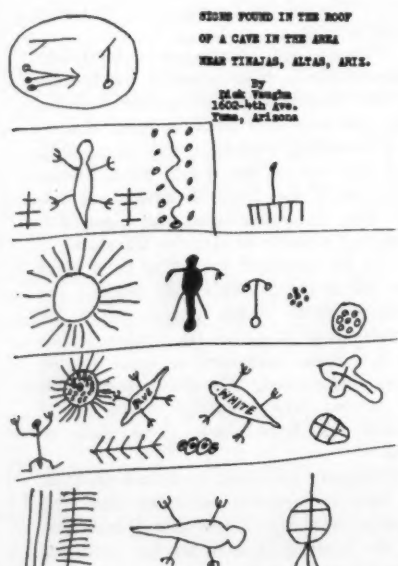


Fig. 81.



Indian Writings . . .

CONTINUED FROM PAGE 189

these interesting paintings. Now, these are all that are left.

Those in Fig. 82 are also from Sonora but are in Altar Valley. The irregularly curved areas represent surfaces that have been eroded or chipped off.

Dick Vaughn of Yuma, Arizona, seems to have discovered another interesting group of Indian picture writings. In a cave near Tinajas Altas, Arizona, a short time ago, he noticed a very interesting group of markings on the ceiling. Having no camera with him at the time he lay on his back on the cave floor and sketched them. (See Fig. 83.)

Some of the figures in the cave reminded Dick of a story he once heard about a couple who still lives in Yuma. Here it is in his own words:

The couple had found a cave somewhere around Tinajas Altas, and on entering it, picked up several church ornaments near the entrance. The man's wife was deathly afraid to go deeper into the cave. They did pick up the ornaments and saw several figurines of some metallic substance in the cave some resembling a gila monster or lizard with eyes that gleamed in the semidarkness.

Because of her fear, they immediately left the cave. As a result of the experience though, the wife had a nervous breakdown. Reportedly they have a map to the cave but have never been back.

Perhaps some of our readers can identify some of the writings in Fig. 83 for him, or give him a clue that will lead to the "Lost Cave of the Metallic Gila Monsters."

Primitive Art

An unusual group of sculptures by primitive artists, showing how European colonial administrators and settlers appeared to the native peoples of Africa, Madagascar, Melanesia, Canada, and our own Southwest, was featured at Chicago

Natural History Museum during July.

This timely exhibit showed how primitive peoples, overwhelmed by civilized man's superior technology, used art to characterize and caricature their European masters. Entitled "Primitive Artists Look at Civilization," the July featured exhibit comprised 31 art objects. It was on display as part of the new Hall of Primitive Art (Hall 2, Main Floor) recently installed at Chicago Natural History Museum under the direction of Phillip H. Lewis, curator of primitive art.

Among the pieces on exhibit are a sensitive carving from Madagascar of a French colonial official's wife, holding a parasol and wearing red highheeled shoes; an arrogant-looking German military official astride a horse—carved by an African artist; a French official "on safari," borne by four porters, flanked by two dogs, and immersed in a book; a New Ireland dance mask satirizing a European wearing a derby hat; and a relaxed sailor enjoying a drink.

A few pieces are from contact situations which are not colonial: for example, a tipi [teepee] curtain made by Cheyenne Indians depicting Custer's "last stand;" and two Canadian officials—said to be a judge and a sea captain—carved by Haida carvers of British Columbia in the late 19th century. Some of the rarest pieces on display were first exhibited at the World's Fair Columbian Exposition in 1893, and formed the nucleus of the collection of primitive art begun by the Museum in that year of its founding.

According to Mr. Lewis, "It is interesting to note that, although caricature was often intended in these sculptures, and Europeans were sometimes shown in unpleasant ways, by and large the characterizations are not particularly derogatory nor malicious. It is as though a desire to produce a sensitive work of art triumphed over the temptation to malicious satire. When we think of the bloody break-up of the colonial empires proceeding today, it is tragic to think that these Europeans seemed to be unaware that they

Fig. 83 (Left).

Fig. 82 (Below).



Our Cover . . .

The Indian carving depicted on our cover is a Haida grave figure obtained by treaty from the village of Tanoo in 1911. It is now in Victoria's Thunderbird Park along with totem poles and other artifacts of the Northwest Coast Indians. The photograph shows the whale and the thunderbird, a mammal and a mythical bird revered by a number of different Indian groups.

Like the cover of our August issue, this one is the work of Joseph H. Wherry, a free lance writer-photographer of Santa Rosa, California.

were being observed with such sharp-edged insight."

Scheduled for completion later this year, the new Hall of Primitive Art will draw together in one vast 8,000-square-foot exhibition area many of the outstanding primitive art objects in the Museum's collections. When completely installed, the hall will contain about 300 art specimens from primitive societies of Asia, Africa, and the Oceanic areas of Melanesia, Polynesia, Micronesia, and Malaysia, as well as from the Australian aboriginal tribes and the American Indian societies of North and South America.

The art pieces are now being selected by Mr. Lewis from the total archeological and ethnological collections of the Museum, numbering about one-half million specimens, of which perhaps fifty to a hundred thousand are primitive art. With this resource, the completed hall is expected to be one of the major permanent exhibits of primitive art to be found in any museum of the world.

(Chicago Natural History Museum News Release)

French Canada Aroused

Two Canadian newspapers (Le Droit, Ottawa, 25 and 27 March, and La Tribune de Hull, 30 March, 1961) have lengthy discussions concerning the site where Dollard sieur des Ormeaux and his group fought this historic battle with the Indians. Recently the Canadian government erected a statue to Dollard at Carillon in Ontario. Thomas E. Lee, archeologist formerly with the National Museum of Canada, has long insisted that the true site was on the Ross farm in Quebec. (See SoM, June 1961, p. 112.) In March, Lee and a group of well known French Canadians went to the Ross site and in the presence of these persons Lee demonstrated his findings. As this site will be inundated shortly by the waters of the Hydro-Quebec reservoir, the Federation des Societes Saint-John-Baptiste are making an outcry for a salvage operation to be directed by Lee. This is a most interesting situation from many angles and one which should be resolved once and for all. (From the *Interamerican*, May 1961. Italics added. Ed.)

Old New World

From the *Christian Science Monitor* comes this editorial under heading, "Old New World."

A major archeological find in Mexico helps substantiate what a few bold American theorists have suspected for some time—that man is a very, very old inhabitant in the New World. Simple animal drawings scratched on a piece of mastodon bone dug up near Puebla, Mex., indicate the presence of men in the Western Hemisphere at least some 30,000 years ago.

As an immigrant, the hunter who used this artifact and other bone implements found with it antedates the 10,000-year-old Folsom man of New Mexico by a far longer span than that gentleman in

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turn antedated Columbus or the Mayflower passengers. He also lends credence to a theory advanced by a semi-professional archaeologist, Louis Brennan. Earlier this year Mr. Brennan published a book detailing evidence of an "Amerind" civilization occupying the hemisphere 30,000 to 40,000 years ago.

According to the Brennan theory, that civilization was as proficient as any Stone Age society of the Old World in such pursuits as basket weaving, pottery, agriculture, and projectile weapons. It rose and fell long before the appearance of later Indian tribal civilizations throughout the hemisphere.

To date this is only informed speculation. But the addition of the 30,000-year-old Mexican mastodon bone carving provides some remarkable new evidence to fit into the hypothesis. Will Rogers once told some Mayflower descendants that his ancestors (Indian) were on hand to greet theirs when the boat came in. That bygone event now seems to have occurred only yesterday.

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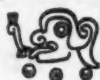
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Dear Editor:



Dear Editor:

Enclosed is a copy of ancient writing that came into my hand in a very unusual way some years ago. It has been sent to eight universities, but as yet no one has translated it.

I am sending it to you hoping that you or some of your assistants might be able to help me.

LaVerna Hatt

Elsinore, Utah

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Dear Editor:

We are thoroughly in accord with your policy of education to reduce destruction of sites. As you know, the Federal Antiquities Act is very ineffective due to lack of enforcement and the impossible policing problem. Nevada passed a State Antiquities Act. However, there is very little state land in Nevada, about 87% being Federal land. Adequate policing and enforcement are serious problems with the Nevada Act also. We believe with you that education of the public is the

real answer but it is a very frustrating task; for instance, your statement that the . . . do not seem to understand your articles. Until two years ago when the Museum added Mr. Shutler to the staff, there had been no archaeologist in Nevada. Mr. Shutler has made many talks to service clubs and other organizations and uses as many volunteer workers as possible on his "digs" in his campaign of education. Vandalism of archaeological sites has been practiced in Nevada since the 1870's however. It is difficult to convince some of the old hands that they are pot hunters.

I have recently gone through a catalogue of S. M. Wheeler, listing Clark County sites investigated by him and S. M. Harrington of the Southwest Museum in 1942. Of more than a hundred sites investigated about seventy per cent bear the notation: "Destroyed by pot hunters." Neither Mr. Shutler nor I know . . .

. . . or have heard of their collection. Mr. Shutler has an archaeological survey to do for the Bureau of Land Management near Caliente in June or July. At that time he will visit them. I agree that their card of stone tools is merely a pretty collection with no data.

J. W. Calhoun, Director

The Nevada State Museum
 Carson City, Nevada

A Point of View

"Dear Sir: I purchased *Indians of Texas* for my child who is 15 and in the Girl Scouts. I did this with the assumption that surely such a thick book would give instructions on how to string Indian beads. Not only does it lack such valuable information, but I was forced to snatch the book away from her clutching hands. The barbaric, obscene customs of those savages should not be printed. I think you are just trying to deprave our innocent youth, and I am writing my congressman about you." *Mustang*, newsletter of the Texas Memorial Museum, Austin. V.3:4. June-July 1961. p. 7.

Is This Good Anthropology?

A letter from an editor of *Holiday*: "Thank you for letting us see your photos of Bolivia. I found them of tremendous interest but, unfortunately, this was not the case with my fellow editors—the reason being, we have nothing scheduled on South America for quite some time to come. In view of your good composition and good color, I would like to remind you that we are concerned mainly with high-class places and people. I am sure you must realize that it is extremely difficult to find beauty among underprivileged people. If we were running something on Indians, we would be interested in the Chief rather than a mob of Indians, who have a tendency to appear dirty and not very picturesque, unless, of course, they were in colorful uniforms, etc."—*Interamerican*, June 1961.

Excavations in Japan

Dr. Masakazu Yoshizaki, Fellow, Instituto Interamericano, reports on the excavation of an early Neolithic site at Narukawa, Nanaemachi, Kametagan, Southern Hokkaido. The site is Proto-Jomon, Sumiyoshicho Type, and is dated about 6000 B.P. Some 5000 potsherds and two complete vessels were found. Almost all of the potsherds were stamp-decorated using the ventral margin of *Pelecypoda*. The bases of the pots are conical excepting two flat bases. Fifty flake tools were found including tongued scrapers, arrow points, spear points, drills and sidescrapers. Forty-nine pebble sinkers were found and 6 polished axes and adzes.

During the summers of 1961 to 1963 a Late Neolithic site of the final Jomon Culture, c. 2300 B.P., will be destroyed by sand iron mining. A desperate effort is being made to salvage this site but \$1500 would be needed for a complete excavation and they have secured only \$500. Things are tough all over!—*Interamerican*, June 1961.

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Corrections, June Issue

Page 138, last sentence, "The Back Cover," should read: Our thanks go to Dr. H. M. Wormington, Curator of Archeology at the Museum for her permission to use this display.

Page 125, col. 3, under heading "Reference" for Kon Tiki article. Delete the credit line accidentally included as a part of reference 9. Credit line should read: Reprinted from *Oceania* with permission.

Cover photo, page 109, by the editor.

Where Was Eden?

If you are conversant with your Bible you will know that the Garden of Eden is described as lying between four rivers, seemingly fenced in by them. Two of these rivers are the Tigris and the Euphrates which are still in existence today. The other two rivers named in Genesis are nowhere to be found. The Biblical description has been thought to place Eden in or near Sumer and Akkad, the oldest inhabited areas we know. This is in or near Ur of the Chaldees from which Abraham is said to have come. So far, however, no archaeologist has ever found the least trace of Eden. Perhaps if we could find the two lost rivers we would know better where to look for Eden. Some religious groups believe that the present Euphrates and Tigris were not the original ones but were named for earlier ones elsewhere. In that case wherever we find the original Tigris and Euphrates we will also find the two lost rivers.

Anthropology Articles . . .

CONTINUED FROM PAGE 182

"Social Anthropology and the Educational System." *School Review* 65:247-59. (30c; Univ. of Chicago Press, Chicago 37, Ill.)

Gruber, Jacob W., "Anthropology and the High School." *American Biology Teacher* 17:228-30, No. 1955. (50c; Interstate Press, Danville, Ill.)

Holmes, Lowell D., "It's More Than Bones and Old Stones." *The Social Studies* 49: 220-222, Nov. 1958. (60c; 809 N. 19th St., Philadelphia 30, Pa.)

Kimball, S. T., "Anthropology and Communication." *Teachers College Record* 57:64-71, Nov. 1955. (Out of print.) "Anthropology and Education." *Educational Leadership* 13:480-3, May 1956. (75c; National Education Assn., Washington, D.C.)

Lee, Dorothy, "Anthropology and American Secondary Education." *Syracuse University School of Education Frontiers of Secondary Education* 11:1-9, Syracuse Univ. Press, Syracuse, N.Y. 1957. (\$2.25; Syracuse Univ. Press, Syracuse, N.Y.)

Opler, M. E., "Cultural Alternatives and Educational Theory." *Harvard Educational Review* XVII No. 1:28-44, Winter '47. (\$1.00; Editorial Board, Lawrence Hall, Kirkland St., Cambridge 38, Mass.)

Redfield, Robert, "A Contribution of Anthropology to the Teacher." *The School Re-*

view LIII No. 9:516-25. (30c; Univ. of Chicago Press, Chicago 37, Ill.) "Universally Human and Culturally Variable." *Journal of General Education* 10: 150-60, July '57. (\$2.00; Univ. of Chicago Press, Chicago 37, Ill.)

Rosenstiel, Annette, "Anthropology and Childhood Education." *School and Society* 87:482-3 (No. 2162. 75c; Society for Advancement of Education, 1834 Broadway, New York 23, N.Y.)

"Educational Anthropology; A New Approach to Cultural Analysis." *Harvard Educational Review* XXIV No. 28-36. (\$1; Editorial Board, Lawrence Hall, Kirkland St., Cambridge 38, Mass.)

Spindler, G. D., "Anthropology in the Social Studies Curriculum." *National Education Assn. Journal* 47:626-7, Dec. 1958 (80c; NEA, 1201 16th St. N.W., Washington 6, D.C.)

"Learning in Culture: Anthropological Perspective." *Educational Leadership* 16: 394-7, April 1959. (75c; NEA, 1201 16th St. N.W., Washington 6, D.C.)

"New Trends and Applications in Anthropology." *Twenty-eighth Yearbook* (1958) of the National Council for the Social Studies pp. 115-43.

Weingrod, Alex, "Anthropology and Social Studies." *Social Education* 20:5-9, Jan. 1956. (50c; NEA, 1201 16th St. N.W., Washington 6, D.C.)

Articles on Specific Courses in Anthropology

Ellison, Jack, "Anthropology Brings Human Nature into the Classroom." *Social Education* XXIV, No. 7:313-. (50c; NEA, 1201 16th St. N.W., Washington 6, D.C.)

Johannis, T. B., Jr., & R. A. Brown, "The Teacher and the Social Studies: IV the Social Studies Teacher and Cultural Anthropology." *The Social Studies*, Oct. 1953:238-42.

Salzmann, Zdenek, "On the Anthropological Aspects of Education at Verde Valley School." *Verde Valley School Newsletter*, No. 30, Jan. 1961. Verde Valley School, Sedona, Arizona.



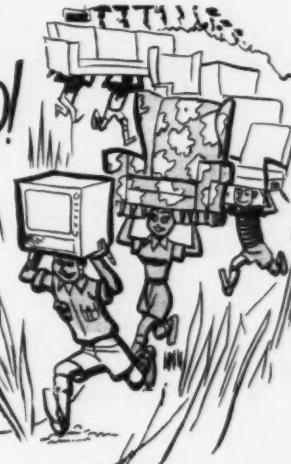
Editorial Office Moves

As indicated on the masthead page (P. 183), the editorial office of SCIENCE OF MAN has been moved from Mentone, Calif., to Garden Grove, California. All mail formerly addressed to Box 643, Mentone, Calif., (manuscripts, letters to the editor, photographs, NALAC matters, etc.), henceforth should be addressed to:

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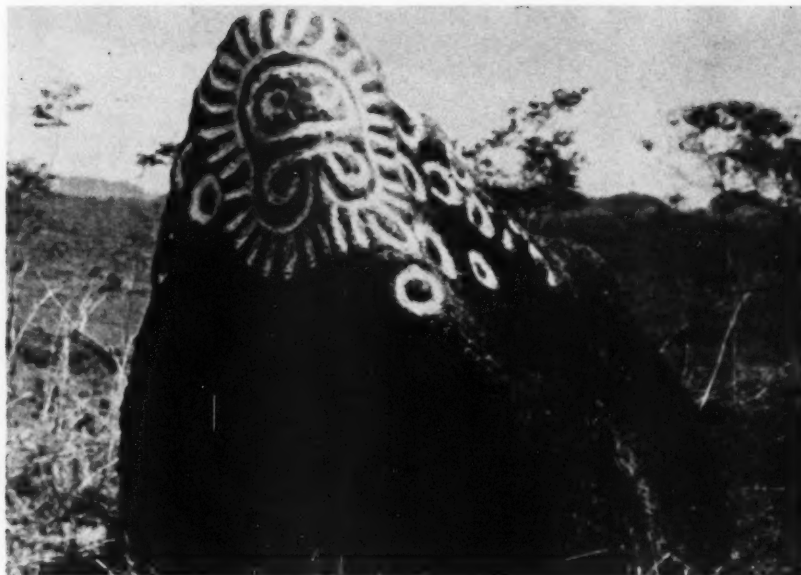
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Mr. Neville A. Harte, a civilian employee of the U.S. Army Engineers in Panama, first became interested in archeology thirty years ago when he investigated the many shell mounds of the Florida Everglades. For the past twelve years he has made a recorded study of the ancient Indian sites and Indian picture writings in the Republic of Panama. He is the author of *A Preliminary Report on Petroglyphs of the Republic of Panama*. His articles and photographs on the Choco and San Blas Indians will appear soon in *SCIENCE OF MAN*. Mr. Harte's photograph above shows a petroglyph at Boca Baja, Chirigui Province, and is from his fine photographic collection.

